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What Constitutes a Drop? *

BY A. E. PHILIPPS, DRUGGIST,
Sanford, Orange Co., Florida.

"THE size of drops varies from various causes, of which the nature of the liquid, the size and shape of the lip of the vessel from which dropped, the extent to which the lip is moistened, and the rapidity of dropping are the most important."—*Parrish.*

"Small quantities of liquid medicines are often administered by *drops*, each of which is usually considered equivalent to a minim, or the sixtieth part of a fluidrachm. The drop of water and watery fluids is, sometimes, about that size; but the same is by no means the case with all medicinal liquids, and the drop even of the same liquid varies much in bulk, according to the circumstances under which it is formed. This is, therefore, an uncertain mode of estimating the quantity of liquids, and should be superseded where minim measures can be had." . . . —*U. S. Dispensatory.*

THE following results were obtained by a druggist from fluid extract of gelsemium (the article used was prepared by R. A. Hance, of Philadelphia):

Number of drops equivalent to a fluidrachm, minim measure—

From the original two-pint bottle.....	75	drops.
" 1 oz. Phil. oval vial.....	100	"
" minim measure.....	136	"
" medicine dropper.....	154	"

To be sure of accuracy, each experiment was repeated, with precisely the same results.

The subjoined prescription was at hand:

℞ Ext. Gelsem	℥ ij.
Syr. Tolut	℥ ss.
Aq. Camph.....	q.s. ft. ℥ ij.

M.

Sig. Shake well and take a teaspoonful every hour as directed.

(It was not unusual for this prescriber to write "extract" when he intended fluid extract.) The dose printed on Hance's label was 3 to 10 drops, so this was to be the guide in the case, notwithstanding the fact that only 2 to 3 drops were directed of the U. S. Ph. preparation. But, before preparing the prescription, there were two questions to settle: First, what constitutes a drop of the gelsemium to be used? Second, how many drops will be included in the prescriber's dose?

Discarding the number of drops obtained from the two-pint bottle, because of its very thick and broad lip, and adding together the number of those obtained from the three other sources, the sum was divided by 3, and the result, 130, was accepted as a fair average number of drops of Hance's preparation to the fluidrachm, not forgetting that 149 drops were required of the U. S. Ph. fluid extract.

By this procedure it was apparent that the prescription in question, if prepared as written, would contain 260 drops of the gelsemium. The dose, as ordered, being $\frac{1}{16}$ of this quantity, would contain 16¼ drops, or little more than 1¼ times the maximum dose authorized by the manufacturer, to say nothing of its being repeated "every hour as directed."

The circumstances were such that it was not practicable to consult the physician, which, it is acknowledged, is a plain duty in such cases. The patient was a chronic sufferer from neuralgia, and was undergoing an attack at the time. The case was familiar to the dispenser, and the fact that such a one, accustomed to strong remedies, might bear larger doses than usual, was considered. Yet to risk 1¼ times the maximum dose of so powerful and dangerous a poison as gelsemium was not to be thought of. It seemed evident that the prescriber had fallen into the common error alluded to in the foregoing passage quoted from the Dispensatory, that a drachm of a liquid signified 60 drops, and that, therefore, the prescription would contain only 120 drops, instead of 260, and his patient would take about 7½—a little more than a medium dose—instead 16¼ drops, or 1⅛ times the maximum.

Acting on this idea, only 120 drops of the gelsemium were used, and this was dropped from the minim measure, that vessel having yielded nearly the accepted average number of drops to the drachm.

The object of this paper is not to present the course taken by the dispenser for criticism. It is understood, however, others might hold that under no circumstances should a physician's prescription be altered without his knowledge and consent. The dispenser admits, as intimated, the correctness of this principle, and practises such a rule, except in extraordinary cases like the one cited, when no alternative remained but to refuse to prepare the prescription and leave a well-known sufferer to suffer, as well as risk unnecessary damage to the doctor's reputation. It is of course his duty to state the circumstances to the prescriber as early as practicable.

But the object in view by the writer is to press the question forming the title of this paper, What constitutes a drop? From what vessel or instrument shall the dispenser drop the various liquids he proportions, in order to secure accuracy and uniformity and to know precisely what he is doing? What standard can be adopted by which both the manufacturer and the dispenser shall be governed, so that the dispenser's drop shall be precisely the same in quantity as that designated and intended by the manufacturer or Pharmacopœia?

The Dispensatory says: "The drop is an uncertain mode of estimating the quantity of liquids, and should be superseded by the minim where measures can be had." But this suggestion is of little value in the present discussion, as will be immediately shown. It can only imply that in the absence of the minim measure the dispenser is expected to *guess* at the quantity to constitute a minim. But even if he possess the minim measure, what then? He is still at a loss, without experiment, to find how many drops make a minim, unless he has a correct drop-former at hand, and then he would not need the minim measure. The number of *drops* is what he wants to know, *not minims*, if the prescriber, as usual, had drops in mind in proportioning his dose.

Prescribers too often confound drops with minims as identical; but this error, as illustrated, is likely at any time to lead to dangerous results, which the minim measure, if used in the same sense, would only *assure* rather than *avert*.

Durand, Proctor, Parrish, Talbot, all come forward with their tables showing how the bulk of a given liquid will vary, dropped from different vessels, or how various liquids vary in the formation of drops under different

* Read before the Florida State Pharmaceutical Association.

circumstances; but none of them offer an expedient by which the difficulty that these very facts place in the way of the dispenser can be obviated. The dispenser cannot possibly keep all these differences definitely fixed in his mind, nor can he exercise necessary despatch if he must stop to refer to tables and calculate, every time he needs to know, how many drops of a certain liquid constitute a given quantity, nor is it likely that the liquid he may be required to measure will always be named in the tables. His confusion, however, does not stop here, but reaches a torturing extreme when, as is often the case, he is compelled to drop the dose of some dangerous poison and finds that neither the table-makers nor any other duly constituted authorities have established a uniform rule for measuring or forming drops! Then it is that he is brought face to face with the question before us—and which, under such circumstances, assumes a grim aspect—*What* constitutes a *drop*?

As it is not practicable, for obvious reasons, to abolish the use of the term "*drop*" and substitute *minim*, universally, it is exceedingly important that some instrument should be adopted by the pharmacopœias as the *only officinal drop-former*, and the drop formed by this instrument should invariably be the quantity signified whenever the drop is directed or intended by the manufacturer or prescriber, or measured by the dispenser.

No further argument is needed to illustrate that the proportioning of doses by drops, formed in the present unofficinal, indefinite, "as-you-please" manner, is not only productive of confusion, but may, on the one hand, lead to falling far short of, and on the other to reaching dangerously beyond, the desired effect.

What, then—it is repeated and emphasized—what, then, constitutes a drop? Or what shall be adopted as the officinal drop-former?

It is needless to add that when this matter shall have been authoritatively settled, the prescriber will be able to substitute *preciseness* for *vagueness* in proportioning his dose of liquid poisons, the prescription druggist will be able to *know* instead of *guess* at the quantity of such poison wanted, and human health and life will be safer at the hands of both.

Process for Assay of Digitalis.*

BY E. L. PATCH.

THE various standards adopted by manufacturers, ranging from 0.01 per cent to 1.5 per cent, would seem to indicate that no reliable method exists.

Mr. F. T. Drake, Ph.G., and Mr. Brooks, class of '91, both of Massachusetts College of Pharmacy, have given some attention to the various schemes for assay of this drug, with comparatively negative results.

From this work, which is not yet complete, I present the following facts:

Investigators are not agreed as to whether digitalis contains digitalin, digitalein, digitoxin, digitin, digitonin, and digitaletin, or that these principles are derivatives of one or more bodies and are results of decomposition in course of process.

The term digitalin seems to be loosely used, and may mean any one of the above named or a mixture of all.

The therapeutic value has been ascribed by some to digitalin (?), by others to digitoxin, and by others to digitalein. Digitoxin is said to be in proportion of 0.01 per cent.

Blyth gives as process for determination: Precipitate 50 per cent tincture with PbA_2, wash precipitate with Na_2CO_3, ether, benzin, and CS_2, then decompose the lead compound.

The following table gives the characteristic ascribed to these principles:

	Digitonin.	*Digitoxin.*	*Digitalein.*	*Digitin.*
Appearance	Amorphous.	Scales or needle cryst.	Amorphous.	
Color	White.	Colorless.	White.	
Soluble in H_2O	Freely.	Insoluble.	Soluble.	Slightly.
Soluble in Alcohol	Slightly, more in warm.	Sparingly.	Soluble.	Freely.
Soluble in Ether		Insoluble.	Insoluble.	Very slightly.
Sol. in Chloroform	Some.		Soluble.	Very slightly.
Soluble in CS_2	Insoluble.			
Soluble in Benzol				
Taste			Bitter.	Tasteless.

* Read before the American Pharmaceutical Association.

	Digitaletin.	*Digitalin.*
Appearance	Warty masses.	Powder. Porous mass. Scales.
Color	White.	White. Yellow white.
Soluble in H_2O	848 parts of cold.	Nearly insoluble.
Soluble in Alcohol	3⅓ parts of 85 per cent.	
Soluble in Ether		Almost insoluble.
Sol. in Chloroform		
Soluble in CS_2		
Soluble in Benzol		
Taste	Bitter.	Very bitter.

The following table gives the properties of market products as found by Mr. Brooks:

	Merck's Digitalein.	*Merck's Digitalin.*	*Merck's Digitin.*	*L. & F.'s Digitalin.*
Appearance	Amorphous.	Powder.	Crystals.	Powder.
Color	Whitish.	Whitish.	Colorless.	Whitish.
Soluble in H_2O	Soluble.	Very soluble.	Soluble in hot, little in cold.	Soluble.
Soluble in Alcohol	Slowly soluble.	Soluble.	Some soluble.	Slowly sol.
Sol. in Chloroform.	Slightly.	Nearly insol.	Insoluble.	Insoluble.
Soluble in Ether	Insoluble.	Nearly insol.	Insoluble.	Insoluble.

	Brooks' U. S. P. 1870 Digitalin.	*Brooks' B. P. Digitalin*	*Brooks' Crys. Digitalin.*
Appearance.	Amorphous powder.	Amorphous powder.	Crystals.
Color	Dark col. Yel. brown.	Dark col. Yel. brown.	Colorless.
Soluble in H_2O	Some in hot, little in cold.	Some soluble.	Insoluble.
Soluble in Alcohol.	Soluble.	Soluble.	Soluble.
Sol. in Chloroform.	Insoluble.	Little soluble.	Soluble.
Soluble in Ether	Insoluble.	Little soluble.	Insoluble.

All were slowly precipitated from aqueous solutions by tannic acid and dissolved by excess.

Merck's crystallized U. S. P. and B. P. at once, and Merck's and L. & F.'s slowly. Digitalein, Merck, was not precipitated. All were precipitated by subacetate of lead.

Merck's crystallized digitin, also called "crystallized digitalin," was the only one precipitate from alcoholic solution by tannic acid. All were precipitated from alcoholic solution by alcoholic solution of PbA_2, Merck's amorphous and crystalline, and L. & F.'s slowly.

Alcohol and water are best solvents. Examination of B. P. and U. S. P. products showed that they contained tannic acid and extractive matter. Varying results can be obtained by tannic acid method, modified by quantity of tannin used, time in precipitation, thoroughness of decomposition of precipitate, etc.

The 1870 process does not direct a practical quantity of animal charcoal. It directs 0.432 Gm. of tannin for 50 Gm. of drug. It requires from 4.75 to 8 Gm.

The alcohol for digesting the dry lead and precipitate should be thrice the quantity ordered.

By U. S. P. method:

German leaf No. 1, Mr. Drake, 1.47.
German leaf No. 1, Mr. Brooks, 2.11.
Select digitalis No. 2, Mr. Drake, 1.38.
Select digitalis No. 2, Mr. Brooks, 4.1.
Powder from No. 1, Mr. Drake, 1.46.
Powder from No. 1, Mr. Brooks, 1.5.

Nativelle's process was tried, with negative results. The process of Mr. R. Palm (A. P. A. 1885, page 340), gave better results than many others, but this wants practice and skill. By this:

German digitalis No. 1 showed 0.326 per cent.
Select digitalis No. 2 showed 0.266 per cent.
Powder digitalis from No. 1 showed 0.014 per cent.

Messrs. Drake and Brooks are still engaged upon this work.

U. S. P. 1870 assay:

Moisten 50 Gm. of No. 60 powder digitalis with 64.5 per cent alcohol and allow to swell during twenty-four hours. Pack in a 16-ounce percolator and pour on enough 64.5 per cent alcohol to have used 110 Gm. in all. Start percolation, and then stop the process, allowing it to macerate four days.

Pour on diluted alcohol and percolate until 127.5 C.c. of percolate are obtained. Evaporate to a thin extract, add H_2O until thin enough to filter, 0.5 C.c. HA.IG purified animal charcoal, and allow to set twenty-four hours, warming and shaking occasionally.

This amount of charcoal is four times the amount called for in the official process, but it is necessary to obtain a light-colored product. The warming and shaking aid the charcoal in removing coloring matter.

Filter and wash with a little H_2O, add NH_4OH to filtrate until nearly neutralized, and then a filtered solution of tannin in H_2O as long as a precipitate forms. This should be added gradually and not in excess. It takes a day or two for it to fully precipitate.

The amount of tannin required varies; the Pharmacopœia uses a solution of 0.432 Gm. dissolved in 8 C.c. H_2O, but in no instance tried did it require less than 4.75 Gm., and usually about 8 Gm.

Collect the tannin precipitate upon a small filter, wash with H_2O, and rub it in a mortar occasionally for several hours with half as much PbO as tannin used. This combines with the tannin and frees the glucoside. Dry in an oven at 50° C., and rub to a powder. Transfer to a small flask, mix it with 0.75 Gm. purified animal charcoal and 10 C.c. alcohol, and digest at 71° C. two hours, occasionally shaking.

The quantity of alcohol here used is three times the quantity given in the Pharmacopœia, but that quantity is not enough to moisten the precipitate. Filter through a small filter into a tared capsule, washing the filter with about 10 C.c. of alcohol.

Evaporate the filtrate and washings, dry at 50° C., powder, and wash with stronger ether until the washings are not colored. This removes coloring matter. Dry at 50° C and weigh. This gives the so-called amorphous digitalin. Its color is yellowish brown and it contains tannin. It was found very hard to remove the tannin with PbO, as one lot of this digitalin treated three times with PbO still contained it. On shaking this digitalin with $CHCl_3$ or ether, small crystals were separated, but in such small amounts as not to be estimated.

The product obtained by this process is so indefinite that no reliance can be placed upon its results. Using the same drug, the yield varied so widely each time, from 1.5 to 3.25 per cent, as to prove the valuelessness of the process. By using more or less PbO the yield can be brought to any desired amount.

The method given by Mr. R. Palm was tried, with quite good results. This is short and comparatively simple. The product under the microscope was found to be in cubical crystals. It was found to be soluble in $CHCl_3$ and alcohol, insoluble in ether and H_2O.

It also estimates the digitin and digitalin. but, with the small quantity used, was found impossible to separate these from an oily substance which contaminated them. The process as used is as follows:

Moisten 50 Gm. digitalis in No. 60 powder with H_2O, and macerate twenty-four hours. Percolate slowly with H_2O until 450 C.c. of percolate are obtained. This practically exhausts the drug. Add to the percolate a saturated solution of PbA_2 as long as a precipitate is formed, and then spirits of ammonia until no further precipitation takes place, and filter. The precipitate contains PbO and the glucosides.

Wash filter, and mix filter and precipitate with a little H_2O, and pass in H_2S to unite with the Pb. When the lead is all precipitated as a sulphide, filter, and the filtrate will contain the digitalein.

Dry the residue, which consists of filter paper, digitin, and digitalin, at 50° C., powder, and exhaust with $CHCl_3$ in a continuous extraction apparatus. Evaporate the $CHCl_3$ solution and obtain crystals of digitalin. Wash with ether to remove color. Dry at 50° C. and weigh.

Dry the residue left in exhaustion apparatus, and then extract with alcohol. Evaporate the alcoholic solution and obtain the digitin.

Mr. Palm's method was to decolorize the percolate with animal charcoal before precipitating with PbA_2, but on trying this it was found to require so much charcoal as to be liable to remove part of the glucosides.

The PbA_2 precipitates the coloring matter with the glucosides, and but little is removed by the $CHCl_3$ after combining the Pb with H_2S.

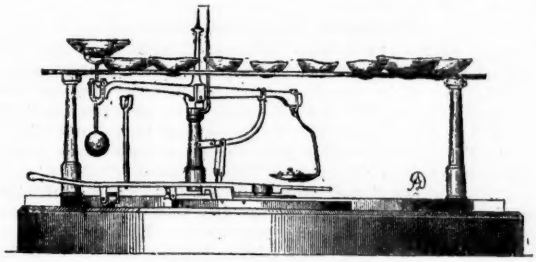
It seems as though a reliable method of assay could be based upon this process, if the products obtained are found to constitute the entire physiological activity of digitalis.

A series of such tests should be made with the different digitalins and their therapeutical value ascertained. It is hoped that some one will experiment in this line, as well as working out a good assay process.

A NEW DISPENSING BALANCE.

A RELIABLE, accurate, and at the same time moderate-priced dispensing balance has long been a desideratum. This has now been supplied by Mr. Nithack, apothecary at Obernigk (Gov. District Breslau).

The main features of the construction of the balance are as follows: The pillar is revolvable in the socket, and provided with a screw by means of which it may be regulated. Above the screw there is a ring with depressions. By means of a spring a pin is held against the ring, which is thus caused to snap into the depressions when the ring is turned. In a semicircle around the pillar there is arranged a small wooden shelf containing 10 openings or notches at equal distances. By turning the pillar, whenever the pin snaps into a depression the scale pan will



Nithack's Dispensing Balance.

have arrived under one of the openings in the shelf, and the proper weight having been laid upon the other, it will lift off the shelf a light vessel intended to hold the powder to be weighed. The other scale pan is provided with a vessel of exactly equal weight. As soon as the proper amount of substance has been weighed into the vessel, equilibrium is restored and the vessel removed and emptied. The scale is then further turned so that the pan will arrive under the next notch, and so forth.

This balance is simple, durable, and handy for use. An especial advantage is this, that it may also be used as a balance of precision. It is about to be put on the market by the well-known firm of Winkler & Jenke, of Berlin.

WATER BATH WITH CONSTANT LEVEL.

THE firm of G. H. Muerrle, manufacturers of apparatus in Pforzheim, makes a water bath which is very useful for laboratories (see cut). As long as there is water left in the bottle, the level of the water in the bath will remain unaltered. The quantity of water in the bottle (about 800 Gm.) is sufficient to last for about five hours. If it is desired, a larger bottle may be substituted, so as to last proportionately longer. The water bath is simple in construction, strongly made, not dependent upon a system of water pipes, and therefore practicable under all circumstances. All parts are united together by a frame. The cost is stated to be very moderate.

A New Musk Substitute.

ANOTHER claimant for favors as a cheap substitute for musk made its appearance in trade some weeks ago. It is manufactured in Germany, and appears in the form of a white, crystalline powder in needle-shaped crystals a few millimeters in length. It is called tonquinol. It is said to be suited both to soap and perfume manufacture, to remain impervious to the influence of light for a prolonged period, and to be easily soluble. An alcoholic solution of 1 in 50 may be diluted with water to any extent, and herein it differs from musk Baur. Tonquinol is said to be soluble in most of the usual solvents, including fats, oils, ether, and chloroform. Its odor is not affected by boiling caustic potassa. The price is about 25 per cent lower than that of musk Baur.—*Chem. and Drugg.*

Phenacoll Hydrochlorate.

THE properties of this new antipyretic have been studied chemically by Dr. Herter (*Deutsch. med. Wochensch.* and *Therapist*) on eight cases, including four of rheumatic fever, and his results, stated generally, are that single doses of 8 grains reduce the temperature in a short time about 1° F., and the same dose given every hour until 24 grains are taken induces a fall of about 2° F., which lasts only a short time. Single doses of 15 grains effect a reduction of temperature amounting to 2° to 3° F. within a few hours (sometimes after one hour), which lasts about two hours. With 75 grains divided over the day, it is possible to produce almost complete apyrexia; it appears, however, that the effect upon the high evening temperature is more reliable and evident than that upon the high diurnal temperature. Shivering or perspiration does not supervene.

In severe febrile articular rheumatism the remedy, in daily doses of 75 grains, has a good effect upon the painful joint affections, but none on the temperature. These beneficial results can be obtained after the ordinary remedies, such as antipyrin, sodium salicylate, phenacetin, and antifebrin, have failed. The remedy has no disturbing influence upon the kidneys. It appears to be very rapidly excreted—at any rate, twelve hours after the suspension of the treatment, the iron reaction was no longer obtainable with the urine.—*Chem. and Drugg.*

Synthetic Quinine.

THE announcement that quinine has been prepared artificially, by synthesis, has been made several times during the last decade or two, and each time excited considerable flurry not only among professional chemists, but also in the quinine market. Unfortunately for the pretenders, the announcement turned out in each case to be premature, and only disappointment resulted where a golden harvest had been expected. At the present time, when the problem seems to have been partly solved, the discovery has no longer the least influence upon the market, though it cannot yet be foreseen what the results would be if the synthesis were really complete, that is, if the alkaloid could be built up from the elements.

Grimaux and Arnaud, two well-known chemists of Paris, have quite recently announced that they have succeeded in converting *cupreine*—the alkaloid nearly allied to quinine, and obtained from a very close relation to the genus Cinchona, namely, Remijia—into quinine (or possibly quinidine).

Cupreine is an alkaloid differing from quinine only by the group CH_2, viz.:

$C_{20}H_{24}N_2O_2$—Quinine.
$C_{19}H_{22}N_2O_2$—Cupreine.

Cupreine has the property of combining very readily with alkalies and other bases to form definite crystallizable compounds. As the editor of the *Chemist and Druggist*, from which paper we make this abstract, remarks, the last British Pharmacopœia makes use of this property of cupreine to detect it in commercial quinine. Yet, so far as the present market is concerned, the test is scarcely of any value, since cuprea bark has become a rare article and is no longer looked upon as one of the staple sources of quinine.

The sodium compound of cupreine is $C_{19}H_{21}NaN_2O_2$. Hesse was the first to establish this, and he conceived the idea that it might be possible to replace the sodium by a methyl group (CH_3), and thereby to produce quinine. But this turned out unsuccessful in his hands. In what precise manner Grimaux and Arnaud have succeeded in accomplishing this we fail to learn, but the process is said to proceed in two steps, viz., first, the production of sodium-cupreine, and, second, its reaction with methylene chloride, CH_2Cl. The result is stated to be a body identical with natural quinine, and, by substituting ethylene or higher derivatives for the methylene compound, compound substances analogous to quinine are produced which, it is believed, may possess interesting medical properties.

Unluckily for the discoverers, the starting point of their process is an alkaloid difficult to procure in our days. The synthesis, or rather partial synthesis, of quinine is, therefore, only a fact of scientific interest.

To Render Milk Free from Milk Sugar for Diabetic Patients.

FROM a lecture recently delivered by Dr. A. E. Wright, of London, on diabetes, we take the following paragraph, after *Chem. and Drugg.*

As to the assimilation of milk sugar, experience has not yet shown that it is innocuous, hence milk is often forbidden to diabetics. It is a great pity, considering its value, that this should be so merely because of the presence of the milk sugar, and by putting together a few facts that have been long known about milk Dr. Miller has been able to separate the proteid and fat of the milk from the sugar—in a word, to precipitate the casein and fat of the milk, to filter them off, allowing all the sugar to run away from them, and then to redissolve the washed precipitate in a solution of the normal salts of milk, to which a little alkali has been added. The process is a very simple one. Take a quantity of milk, dilute it with 3 or 4 volumes of water to which 1 to 2 parts per 1,000 of acetic acid have been added. This produces a precipitation of all the casein and fat of the milk. The precipitate is allowed to settle for a few minutes, and is then strained through a piece of calico. The precipitate is then washed and redissolved in a 1-per-cent solution of the following mixture of salts:

	Parts.
Sodium Chloride	11.5
Potassium Chloride	9.9
Mono-potassium Phosphate	13.8
Di-potassium Phosphate	10.8
Potassium Citrate	5.9
Di magnesium Phosphate	4.0
Magnesium Citrate	4.4
Di-calcium Phosphate	8.0
Tri-calcium Phosphate	9.6
Calcium Citrate	25.5
Calcium Oxide	5.5
Sodium Carbonate	40.0

A trace of saccharin may be used to sweeten the milk. The salt solution is best used at about blood temperature, and the casein and fat precipitate is to be mixed up with it, as in making cocoa, to the desired thickness. We obtain by this easy method a very fairly palatable and entirely sugarless milk. The precipitated casein and fat can also be dried without undergoing alteration, and then used for the preparation of the milk.

Preservation of Litmus Solutions.

B. BALLI recommends to use carbolic acid for the preservation of litmus solutions. After having prepared a neutral sensitive solution, it is mixed with enough carbolic acid to make it possess the distinctive odor of the latter. But it is preferable first to remove the carbonic acid present in the solution by heat, and to add the carbolic afterwards, since the latter would be partly lost if heat were applied to the solution already containing it.

Salicylic acid had previously been recommended by the same author for this purpose. This is, however, objectionable for several reasons. In the first place, it is not so good a preservative, and, besides, it changes the coloring matter by turning it red, so that it has to be neutralized before being used.—*Chem. Zeit.*, 1891, 68.

PROPOSED METHOD OF DISPENSING TUBERCULIN.

MR. F. LUTZE (in *Pharm. Zeitung* No. 11) proposes a new method of putting up and dispensing Koch's lymph, or tuberculin, which does away with the pipette, measuring cylinder, water, alcohol, etc., etc., heretofore in use each time a particular dilution of the lymph had to be prepared.

He has caused to be prepared two small cases, containing—besides other articles presently to be mentioned—either a Koch syringe or a sterilizable hypodermic syringe with asbestos piston, according as the purchaser prefers the one or the other. Each case contains also 20 small vials (glass drops) holding varying quantities of Koch's lymph, running from 1 Mgm. to 200 Mgm., each dissolved in ½ C.c. of water. The glass drops are closed by fusion. The several drops are labelled with differently colored labels, the milligramme series (up to 9) with a white label, the centigramme series (10 Mgm. to 90 Mgm.) with a red, and the decigramme series (100 to 200 Mgm.) with a green label. The cases

Lutze's Mode of Dispensing Tuberculin.

contain also an ample supply of alcohol for sterilizing, and two small appliances for facilitating the filling of the syringe. Fig. *a* represents one of the closed glass drops. Fig. *b* is a small metallic key for uniformly breaking off the points of the glass drops (shown in Fig. *d*). Fig. *c* is a small glass cylinder for supporting the glass drop when opened, after which the needle of the syringe is inserted into it and the latter filled, as shown in Fig. *e*. The point of the needle should not come into contact with the bottom of the drop, since the small amount of liquid eventually remaining in the drop has been made allowance for when the drop was charged with liquid. Only ½ C.c. must be withdrawn by the syringe.

SPECIFIC-GRAVITY BOTTLES FOR VISCID SUBSTANCES.

J. W. BRUEHL communicates a method by which the specific gravity even of very viscid substances may be determined with perfect accuracy and great facility.

For this purpose he uses a specific-gravity bottle of the shape shown in the illustration. The neck of this flask is not quite as narrow as is usual in this form of apparatus. Both orifices are provided with differently shaped, accurately ground stoppers. Some distance below the lateral tube the neck of the flask is provided with a mark, up to which it is to be filled.

A pipette must also be provided, with an orifice as large as it is possible to employ with the particular liquid under investigation. The pipette must have a diameter permitting its being pushed down through the neck to the bottom of the flask without difficulty.

First the pipette is filled with the substance to be examined. For this purpose it is inserted, by the point, into the latter, and the upper end of the pipette connected with the filter or vacuum pump. If the viscid liquid or substance is hygroscopic, no direct connection with the vacuum pump must be made, but a chloride of calcium tube is to be interposed. Even the toughest liquid will thus be made to fill the pipette in a few minutes. Next a short piece of rubber tubing is slipped over the upper neck (bearing the round-headed stopper), and the pipette, which had previously been cleaned, pushed through the projecting part of the tubing, down through the neck, into the flask. There is no need of pushing it down so far that it will dip into the liquid.

Next the lateral neck is connected with the pump, and by exhausting the flask the contents of the pipette are in a short time discharged. The operation is repeated until sufficient liquid has been transferred to the flask to fill it to the mark at the proper temperature.

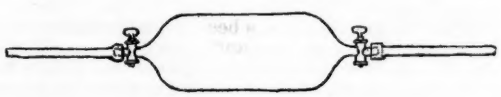
The exact adjustment to the mark is made by means of a pencil of rolled cigarette paper or of soft, porous wood. And the interior of the neck is best cleaned by means of rolled strips of muslin.

The experience of the author has shown that when a flask holding 10 C.c. was employed the specific gravity of a viscid liquid could be very exactly determined up to and including four decimals.

The author determined by this method the specific gravity of substances which were so viscid that they would not flow even from a flat capsule when this was turned over.—After *Berichte*, 1891, 182.

C. SCHEIBLER described a very simple apparatus for the correct determination of the specific gravity of liquids, some twelve years ago, which apparatus appears to him to be even more practical than that recently proposed by J. W. Bruehl.

The apparatus is a sort of pipette, with ample bulb, drawn out at either side to a narrow tube carrying a stopcock close to the body, and the tube extending only a small distance beyond each stopcock. In addition, there are provided two pieces of glass tubing, ground so as to fit air-tight over the projecting ends of the pipette. The tubes are distinguished by letters or numbers, cor-



responding to similar ones engraved at either end of the pipette.

When the apparatus is used, the liquid is brought to the precise temperature at which its specific gravity is to be taken, the two detached glass tubes slipped over the ends of the pipette, the stopcocks opened, and the liquid made to ascend in the pipette by suction or aspiration. When it has risen above the upper stopcock, the latter is closed, the glass tubes are detached, and the short tubes projecting beyond the stopcocks cleaned. The apparatus is then weighed. If the weight of pure water required to fill the pipette at the same temperature is known, the specific gravity of any other liquid is easily calculated in the usual manner.

Apyonin is the name of a substance of the methyl violet class which has been introduced as an antiseptic similar to Merck's pyoktanin. It is a yellow, crystalline powder, slightly soluble in cold and hot water, soluble in alcohol, and difficultly soluble in ether. Heated it sublimes, charring at a higher temperature, and burning without ash. The water solution is neutral, and gives a precipitate with caustic potash, which is soluble in alcohol. The plain solution produces colors on the addition of hydrochloric acid or peroxide of hydrogen solution. We are without particulars of the therapeutics of this substance, which is made by Petit, of Paris.—*Chem. and Drugg.*

New Source of Oxalic Acid.

A PRAGUE chemist has devised a process for recovering oxalic acid from the waste liquors produced in manufacturing wood fibre by the sulphite process. It is found that 100 parts of waste liquor give an average of 12 parts of dry residue on evaporation, which contains 9.5 parts of organic and 2.5 parts of mineral matter. The filtrate, which contains chiefly lime salts besides the organic matters, is mixed with more than sufficient sulphuric acid to combine with the lime, the action being continued until all free and combined sulphurous acid is expelled, which may be condensed and utilized if desired. If any excess of sulphuric acid has been added, it is removed by carefully neutralizing with lime or chalk. After settling, the purified liquors are concentrated to about 40° B., sometimes to dryness. While still warm the mass is mixed with double its weight of a mixture of 2 parts of quicklime and 1 part of caustic soda. The mixture is heated, with constant stirring, in iron vessels to a temperature of above 100° C., whereby it is changed into oxalic acid, which combines with the bases, and is afterwards purified.—*Chem. and Drugg.*

A Method of Cutting Glass Tubes, Bottles, etc.

MR. WM. THOMSON recently read some papers before the Society of Chemical Industry, one of which treated of the subject mentioned in the title.

The method consists in having some strips of thick blotting paper at hand, from a quarter to half an inch in width, and of different lengths. Two pieces of such paper are wetted and wrapped around the bottle, tube, or other vessel to be cut, once or oftener (once is sufficient). These pieces of paper, cut true, are wrapped around the vessel like two bands. They must not be placed too close together—say from a quarter to three-eighths of an inch apart for larger vessels, and rather less than a quarter of an inch apart for tubes of an inch in diameter.

When this is arranged, a fine flame about two or three inches long is allowed to play on the glass between the two pieces of wet paper, the vessel being slowly revolved and the point of the flame kept between the two papers. Within a minute, usually, the vessel separates with a clean cut along the line against which the flame played. The blotting paper can then be removed and put aside for use on other occasions.—After *Chem. and Drugg.*

Preparation of Pure Phosphoric Acid.

POWDERED calcium phosphate is added gradually to a slight excess of commercial hydrofluoric acid diluted with an equal volume of water and contained in a leaden or platinum vessel. There is considerable development of heat, and the liquid must be thoroughly agitated. When the action moderates, the liquid is gently heated, water being added to make up for loss by evaporation. When the liquid becomes viscous, the excess of hydrogen fluoride begins to escape, and the mixture is then heated until the expulsion of the acid is complete.

The syrupy liquid thus obtained contains from 60 to 70 per cent of phosphoric anhydride in the form of orthophosphoric acid. With pure materials, the phosphoric acid obtained is very pure; if bones and ordinary acid have been used, the product must be heated to carbonize the organic matter, dissolved in water, filtered, and again evaporated. Pyrophosphoric and metaphosphoric acids can be obtained by evaporating at higher temperatures.

If hydrofluoric acid is added drop by drop to a large excess of powdered calcium phosphate, and the product is extracted with warm water, the solution, on evaporation, leaves a residue containing the various salts described by Erlenmeyer.—M. NICOLAS, in *Compt. Rend.* and *J. Chem. Soc.*

Preparation of Pure, Concentrated Nitric Acid.

WHILE preparing pure nitric acid for the purpose of revising its tables of specific gravity, Prof. Lunge and Mr. Rey encountered much difficulty in obtaining a highly concentrated, pure, and colorless acid.

As long as the nitric acid is comparatively weak, nitrogen tetroxide or hyponitric acid may be easily expelled by warming and passing a current of air or carbonic acid gas. A very strong acid, however, is so prone to decompose into nitrogen tetroxide, oxygen, and water that the ordinary method is insufficient. Passing a current of gas, as just mentioned, will not do, since this removes as much of nitric acid itself as of the impurities. The strongest acid which could thus be obtained contained 98.5 per cent.

The following method, however, was finally found to be effective:

A quantity of nitric acid, prepared and deprived of coloring impurities in the usual manner, and containing 98.7 per cent of absolute nitric acid, was put into a retort together with twice its volume of absolute sulphuric acid (H_2SO_4), and distilled *in vacuo*, the pressure being reduced to 20 Mm. by means of a water-jet pump. This was found to be the only way to prevent the acid from becoming yellow. The connection between the neck of the retort and the receiver was effected by wrapping with asbestos paper and an external coat of moulder's clay. Great care was taken to insure the absence of organic matter. The distillation took place at a temperature of 35° C. (in the retort), and the distillate was completely colorless. It contained 99.7 per cent of HNO_3, and was probably the strongest and purest nitric acid ever obtained.—After *Zeitsch. f. angew. Chem.*

Preparation of Hydrobromic Acid.

W. FEIT and K. KUBIERSCHKY have made experiments with different methods of preparing hydrobromic acid, and have at last concluded that the process involving the use of potassium bromide and sulphuric acid is the most advantageous. They have evidently remained in ignorance of the papers published on the subject by Dr. Squibb, and for this reason had to go over the whole ground anew. Hence, their results are also somewhat different from those of Dr. Squibb, and for this reason should be put on record.

They found the best proportion to be as follows: 100 Gm. of potassium bromide and 150 C.c. of sulphuric acid of the specific gravity 1.410. This represents a molecular proportion of 1 part of the former to 2.6 parts of the latter.

The potassium bromide is introduced, coarsely powdered, into a retort, the acid added, and the whole slowly warmed, under repeated agitation, until the salt is dissolved. Distillation is then commenced. The liquid in the retort has a faint yellowish color, which is not, however, due to free bromine, but is, perhaps, caused by organic impurities. At 126° to 127° C. the liquid begins to boil; afterwards the boiling point rises gradually to 150° C. During this time almost the whole of the hydrobromic acid passes over. From 150° up to 200° C. the boiling point rises rapidly and but little liquid distils over. This portion contains a trace of sulphuric acid which is carried over mechanically. Between 200° and 250° C. only very little hydrobromic acid passes over, and that which passes contains more sulphuric acid than the preceding fraction.

Distilled in the described manner, 100 Gm. of potassium bromide yielded 119 C.c. of hydrobromic acid of the specific gravity 1.385, or 165 Gm. of acid containing 40.5 per cent of absolute acid. That is, the 100 Gm. of KBr yielded actually 66.8 Gm. of absolute acid instead of the theoretical 68.1 Gm. No separation of potassium sulphate takes place during the whole operation. The residue in the retort still contains about 1 Gm. of potassium bromide.

In order to free the hydrobromic acid thus obtained from the small amount of accompanying sulphuric acid, and to concentrate it at the same time, it is subjected to fractional distillation. At first a dilute acid passes over, and afterwards an acid having the permanent boiling point of 126° C. This contains 48 per cent of absolute hydrobromic acid, and has the specific gravity 1.490. It is absolutely colorless, and free from sulphuric or sulphurous acid, as well as from free bromine.

If the potassium bromide used in this process contained any bromate, bromine is at first liberated and passes over. In this case the receiver is changed as soon as a colorless distillate passes. The acid is then treated with solution of sodium hyposulphite in drops until it is colorless, and finally rectified like the other.—*Chem. Zeit.*, 1891, 444.

The Absorption of Fusel Oil by Wood, etc.

A PAPER on "The Chemistry of Whiskey," recently read by Mr. A. H. Allen before the Society of Chemical Industry, sheds new light upon the well-known fact that whiskey or other distilled spirits kept in wood will gradually lose their fusel oil, become riper and mellower, and develop a more fruity and pleasant odor and taste.

Mr. Allen found that the cork of a 2-gallon jar of whiskey kept on its side absorbed as much fusel oil as was contained in 6 ounces of the whiskey. He therefore took some of the spirit, and placed cork and oak shavings into separate portions, and a distillate of the shavings afterward showed that they had absorbed fusel oil equivalent to 11 per cent of what was in the whiskey. Specimens of these were shown. This matter has direct connection with the custom of grogging whiskey casks. A certain amount of the spirit is always in the wood, and it is taken out by pouring water into the cask and afterward distilling the aqueous fluid. A sample of grog from a cask in which whiskey had been kept for eighteen years was obtained, as well as the first and final distillates from the grog. The grog itself contained 291 grains of amylic alcohol per gallon. The first distillate from the grog had a strong odor of aldehyde and contained 12 per cent of acetic ether.

The last distillate contained no less than 803 grains of amylic alcohol per gallon and was also rich in furfurol. It may be noted that samples of Scotch whiskey contained 89 grains and Irish whiskey 78 grains of amylic alcohol per gallon. Now, these results clearly show that in the cask there is a disappearance of amylic alcohol due to absorption, and that etherification does take place by ageing is shown by the first distillate containing aldehyde and acetic ether. Of course, it is also probable that when the aldehyde is oxidized it is converted into acetal, which is a very fragrant body.—After *Journ. Soc. Chem. Ind.*

Aristol.

SOME question has been raised recently as to the purity of the substances met with in commerce as representatives of the compound introduced as an antiseptic first under the name "annidaline" and then as "aristol."

It will be remembered that aristol has been described as being obtained by treating an aqueous solution of iodine in potassium iodide with thymol in caustic soda solution. The impurities that it might be expected to contain, therefore, would be free iodine, alkali, or alkaline iodide. Mr. Reuter reports (*Apoth.-Zeit.*, January 28th, p. 61) the examination of two samples, one of older date than the other. Both, upon being skaken with water, gave a solution which was perfectly neutral, but which upon evaporation left a residue of alkaline iodide, amounting in one case to 1.6 per cent. Upon treating the samples with ether, in which pure aristol is perfectly soluble with a yellow, not a brown color, a residue was left from the older specimen amounting to 4.8 per cent, and from the other to 1.6 per cent, this residue containing much alkaline iodide and possibly an insoluble organic iodine compound. Upon shaking the samples with 1 per cent potassium iodide solution, the filtrate from the older one gave with starch paste an intense coloration, showing the presence of free iodine, but the filtrate from the other remained free from color.

It seems probable, therefore, that the aristol of recent manufacture is less contaminated with free iodine than the earlier specimens, but that it still contains alkaline iodide.

In respect to purification, Herr Reuter states that if a solution of aristol in cold glacial acetic acid be treated with water and the precipitate thoroughly washed and dried at 60° C., a faint yellowish product is obtained that dissolves clear and without residue in ether and contains no free iodine. But the question arises whether an absolutely pure preparation is advantageous, for it would appear that pure aristol is much more stable than has been supposed, and consequently less likely to act as a bactericide than a preparation rendered unstable by the presence of more or less free iodine or alkaline iodide. This might account for some of the contradictory experiences with this substance that have been reported, as, for instance, that of Prof. Neisser, in whose hands aristol proved quite inactive, except in some cases of lupus, where it was applied to patches that had been treated previously with a caustic.—*Pharm. Journ.*

APPARATUS FOR THE MANUFACTURE OF LIQUID CARBONIC ACID.

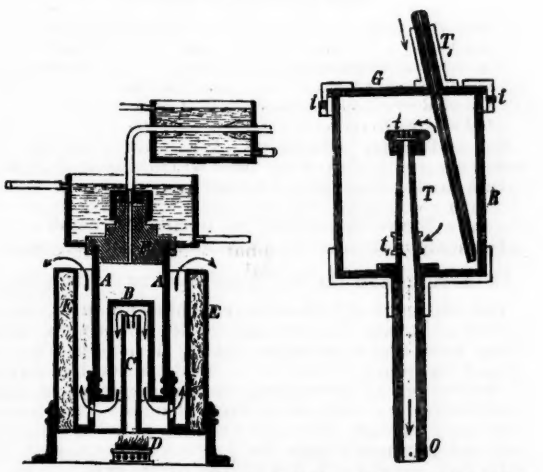
THE liquefied carbonic acid gas in this process is prepared by heating bicarbonate of sodium under pressure.

The heating is conducted in a strong retort having the form shown in A (see figure), which permits the utmost heat effect. The heated gases arising from the furnace D pass up through the tube C, descend along the inner walls of the retort, and finally pass out through E. The retort is charged with dry bicarbonate of sodium, and the latter is split, by heat, into carbonate of sodium, water, and carbonic acid gas:

$$\underset{\text{sodium bicarbonate}}{(NaHCO_3)_2} = \underset{\text{sodium carbonate}}{Na_2CO_3} + \underset{\text{water}}{H_2O} + \underset{\text{carbonic acid gas}}{CO_2}$$

The mixture of water vapor and gas passes out through F, and then enters a condenser, where the steam becomes condensed, while the gas passes on, first traversing a wash apparatus, a desiccator, and is finally condensed, by its own pressure, in a condensing cylinder properly cooled. This cylinder is suspended from a scale beam, so that its contents may at all times be readily ascertained by proper counterpoise.

This apparatus is patented in Germany by H. Beins & J. F. Beins, of Gröningen.



Beins' Carbonic Acid Apparatus. Ducretet's Carbonic Acid Apparatus.

PREPARATION OF SOLID CARBONIC ACID.

IN connection with the preceding, or any other apparatus yielding liquid carbonic acid gas, the following apparatus designed by Ducretet may be used for producing the solidified acid.

R is a cylinder made of hard rubber, having a cover, G, which may be closed by a bayonet clamp, *i*. The tube T, which passes through the cover, reaches nearly to the bottom of the cylinder. When the liquefied acid is admitted to the cylinder through this tube, it is projected against the bottom and most of it solidified, while the gaseous portion and the displaced air are driven from the cylinder through the tube O, the inner orifice of which is covered by a piece of fine-meshed wire gauze.

While the liquid carbonic acid gas is being projected against the interior wall of the rubber cylinder, so much electricity is produced that a constant spark of about 1 Cm. in length may be maintained between the metallic coverings of the entrance tube T and of the exit tube O.—*Dingl. Polyt. Journ.*

Obtaining Oxygen from the Air.

A NEW process has been patented for obtaining oxygen from the air. At a red heat a mixture of lead monoxide and an alkaline earth will absorb oxygen, with the formation of lead dioxide and a plumbate of the alkaline earth employed; and if carbonic acid be then passed over the mass, the absorbed oxygen will be driven off. The applicant proposes to apply this reaction to the recovery of oxygen from the atmosphere. He passes air over a heated mixture of lead monoxide and lime, thereby absorbing the oxygen and allowing the nitrogen to pass off: $2CaO + PbO + O = Ca_2PbO_4$. When the mixture has been saturated with oxygen, the air is turned off. Carbonic acid is introduced, expelling the oxygen, and itself combining with the remaining calcium oxide: $Ca_2PbO_4 + 2CO_2 = 2CaCO_3 + PbO + O$. The reaction is so rapid that at first only pure oxygen is evolved. Toward the close of the operation some carbonic acid is disengaged, but this can readily be removed by a suitable absorbing agent, such as lime or sodium carbonate. The mixture of calcium carbonate and lead monoxide now remaining in the retort is immediately treated (at a red heat) with air, or, to hasten the expulsion of the carbonic acid, with steam and air. The same reaction (the absorption of oxygen) is thus again brought about; and the process may be repeated at pleasure. It is also possible to recover the carbonic acid used in the process. Other metallic oxides—the lower oxides of manganese, for example—may be employed instead of lead monoxide. The oxygen of the pure dioxide (PbO_2, or MnO_2) and of the corresponding metallic peroxides are also very easily driven off by carbonic acid.—*Scient. Am. Suppl.*

Salicylic-acid Shampoo.

Salicylic Acid	25 Gm. or 380 grs.
Glycerin	50 " " 760 grs.
Alcohol of 68 per cent	950 " " 30½ troy oz.
Oil of Wintergreen	5 drops.
Oil of Rose	1 drop.
Oil of Neroli	1 drop.

Mix and filter. Directions: Wash the head well with warm soapsuds, then with pure warm water, and dry it with a towel. Then pour two tablespoonfuls of the shampoo into a wineglass, fill this with warm water, and apply the mixture thoroughly, by means of a small sponge, to the scalp and hair.—E. DIETERICH in *Pharm. Centralh.*

Fluorides and Hydrofluoric Acid as Antiseptics.

THE efficiency of hydrofluoric acid as an antiseptic and antiferment has been recognized for some time, and is being more and more appreciated. It is now being employed by many brewers and distillers for the purpose of destroying or preventing the development of germs which interfere with the normal alcoholic fermentation. Curiously enough, the acid (used in judicious quantity) will not only not hinder the growth of the normal alcoholic ferment germ, but will even promote it.

There is, however, one drawback connected with the use of the free acid, as is well known. Owing to the affinity of the acid for silica, it can only be carried or stored in certain metallic or in caoutchouc or rubber containers. For this reason experiments have for some time been in progress to ascertain whether the fluorides of sodium or of allied bases could not be employed. Of course, it was to be expected that neutral fluorides, *per se*, would be devoid of any antiseptic properties. That an acid, expected to act as an antiseptic, must be in a free state, has long been known, a familiar example being salicylic acid. But it has been discovered by Effront that certain organic acids, such as acetic, butyric, lactic, and oxalic, have the power of decomposing neutral fluorides, and setting hydrofluoric acid free. This is easily shown by the fact that a solution of a neutral fluoride, when acidulated by such an acid, will etch glass. Placing the above-mentioned acids in the order of their greatest effect, the first will be oxalic, and the others will be, successively, lactic, acetic, and butyric acids.

The peculiar effect of the influence of hydrofluoric acid upon the process of alcoholic fermentation—which no doubt consists mainly in suppressing fermentative processes which might arise from the presence of bacteria—is seen, for instance, from this, that when a mash treated with hydrofluoric acid is filtered it will at once yield a clear filtrate. It will also give a much purer suboxide of copper with Fehling's solution, and a smaller precipitate with subacetate of lead. Moreover, it is asserted by competent authorities that the odor and taste of the distilled product are much nearer to what an absolutely pure distillate would be.

Manufacture of Salicylic Acid.

Kolbe's original method of preparing salicylic acid synthetically (by the action of carbonic acid upon phenol in presence of sodium) was modified by him in 1874 in the following manner, which rendered its execution on a large scale possible and profitable: A solution of phenol in a quantity of solution of soda sufficient for saturation was evaporated to dryness, and the resulting phenol-sodium (C_6H_5ONa) heated in an atmosphere of carbonic acid gas, at a temperature of 220°–250° C., until no more phenol passed over. The product of the reaction, di-sodium salicylate, was then dissolved in water, the solution decomposed by hydrochloric acid, and the crude acid purified by recrystallization, or by distillation with superheated steam. In this process one-half of the phenol is recovered unchanged. Schmitt subsequently ascertained that the whole of the phenol may be converted in one operation into salicylic acid by acting with carbonic acid gas upon phenol-sodium at the ordinary temperature and then heating the resulting phenyl-sodium carbonate in closed vessels, when it is completely changed to salicylate of sodium. The modus operandi is as follows: Dry phenol-sodium is mixed, under cooling, with a little more than the calculated quantity of liquid carbonic acid, and the whole is then heated during several hours in a closed vessel at a temperature of 120°–140° C. The resulting mono-sodium salicylate is decomposed with hydrochloric acid, and the salicylic acid thus separated purified by recrystallization. The reactions are as follows:

$$\underset{\text{phenol}}{C_6H_5OH} + \underset{\text{soda}}{NaOH} = \underset{\text{phenol-sodium}}{C_6H_5ONa} + \underset{\text{water}}{H_2O}$$

$$\underset{\text{phenol-sodium}}{C_6H_5ONa} + \underset{\text{carb. acid}}{CO_2} = \underset{\text{phenyl-sod. carb.}}{C_6H_5OCOONa}$$

$$\underset{\text{phenyl-sod. carb.}}{C_6H_5OCOONa\ \text{(heated)}} = \underset{\text{sodium salicylate}}{C_6H_4OHCOONa}$$

which last salt is then decomposed by acid, yielding $C_6H_4OH.COOH$, or $C_7H_6O_3$, salicylic acid.

Bettendorff's Arsenic Test.

H. WARNECKE points out that the solution of stannous chloride prescribed by the last German Pharmacopœia, and used, among others, as a test for arsenic, is not of the proper character to answer for the latter purpose. The Pharmacopœia directs it to be prepared by triturating 5 parts of stannous chloride (crystals) with 1 part of hydrochloric acid to a paste, and saturating this completely with dry hydrochloric acid gas. The resulting solution is allowed to deposit and then is filtered through asbestos.

Warnecke finds that the test is satisfactory only when concentrated hydrochloric acid is used, and only as much stannous chloride as is required for the reduction of the arsenic which may be present.

He finds that by modifying the test as follows, satisfactory results are obtained:

Make a solution of 1 part of crystallized stannous chloride in 2 parts of strong, fuming hydrochloric acid (spec. grav. 1.190 to 1.200). For every 1 C.c. or 1 Gm. of the substance to be tested use 5 C.c. of stannous solution. In most cases a gentle heat may be employed with advantage. Only the appearance of a *brown color* or of a *brown precipitate* is evidence of the presence of arsenic, but not any other color.—After *Pharm. Zeit.*, 1891, 167.

[*Note by Ed. Amer. Drugg.*—Bettendorff's test has recently been studied by a well-known chemist of this country, who has succeeded in eliminating all features of uncertainty. It is expected that he will shortly publish the method.]

On the Presence of Boracic Acid in Caustic Alkalies.

SEVERAL samples of caustic alkalies from Schuchardt, Marquart, and Trommsdorf, described as "chemically pure," were found to contain boracic acid. Meissl's method for determining boracic acid in milk was employed; *i.e.*, the alkalies were just saturated with acid in a platinum dish, the salts moistened with a little dilute hydrochloric acid (1:100), a few drops of tincture of turmeric added, and then evaporated to dryness. Traces of boric acid caused a cherry or cinnabar-red coloration. The flame test was also used. From the degree and delicacy of the reaction, it may be assumed that the quantity of boracic acid exceeded 0.1 per cent.

This should be taken into account in quantitative determinations of boracic acid, as caustic potash is frequently employed in them.—*Journ. Anal. Chem.*

Detection and Estimation of Boracic Acid in Milk, Cream, etc.

THE following paper was read at a meeting of the Society of Public Analysts (London) by Charles E. Cassal:

The presence of boracic acid and borates in milk and cream can be detected without difficulty by applying the turmeric test, and the alcohol-flame test to the ash.

The ash obtained in the course of the ordinary analysis is treated with a little water and made just acid with hydrochloric acid.

Numbered slips of turmeric paper are moistened halfway with the solution, and are preferably arranged on a glass plate and dried in the air bath; or a few drops of turmeric solution are added to the acidified ash, and evaporated to dryness in a porcelain capsule, the latter method being an exceedingly delicate one. On moistening with an alkali, the dark blue color is obtained on the paper or porcelain when boracic acid is present. A dark blue solution is obtained when water and an alkali are added to the residue in the porcelain capsule, but the color disappears with great rapidity, and I have hitherto been unsuccessful in determining the conditions which would render it permanent, or sufficiently permanent to admit of its being applied for purposes of estimation.

The only method which up to the present I have found to be applicable for the estimation of boracic acid in milk and cream is a modification of that described by F. A. Gooch in the *American Chemical Journal*, and which depends on the fact that free boracic acid can be completely separated from fixed substances by repeated distillation with methyl alcohol. I have repeated Mr. Gooch's experiments, and am able to confirm his results generally. He states that methyl alcohol, ethyl alcohol, and water are effective for the purpose of separation, in the order named, and this I have found to be the case; but the volatilization of even 0.2 Gm. of anhydrous boric acid by the use of ethyl alcohol is so tedious that it is not advisable to use this substance for the purpose

Complete volatilization of boric acid by the use of successive charges of methyl alcohol is easily and rapidly effected.

I have found it best to use successive charges of 5 C.c. rather than 10 C.c. or more as used by Mr. Gooch. I am not able to confirm his statement that in the presence of water methyl alcohol is not equally effective.

My own experiments show that crystallized boracic acid is volatilized more rapidly than anhydrous boric acid, and that the addition of a few drops of water to the latter before evaporation or distillation with methyl alcohol promotes rather than retards the volatilization of the acid.

The method as now applied by me for the estimation of the acid in milk and cream is as follows:

In the case of cream about 50 Gm., and in that of milk about 100 Gm., of the sample are rendered alkaline with caustic soda, evaporated to dryness, and incinerated. The ash, which need not, of course, be burnt white, is ground up and transferred, by washing with a little methyl alcohol and a few drops of water, to a conical flask of from 200 C.c. to 300 C.c. capacity, provided with a doubly perforated rubber cork, through which pass a stopcock funnel tube and a delivery tube. The flask is attached to an ordinary condenser by means of a flexible joint in such a way as to admit of its being shaken round occasionally, and is placed in an oil bath.

The mixture in the flask is acidified with acetic acid, and 5 C.c. of methyl alcohol are run in from the funnel tube and distilled. The distillate is received in a weighed amount of pure lime (ignited to constant weight). About 1 Gm. is a convenient quantity. The lime is contained in a platinum dish capable of holding about 70 C.c., which is placed in a glass receiver. This receiver may be made from a ground-edged glass vessel, covered with a perforated ground-glass plate The end of the condenser tube passes through a grooved or loosely fitting cork in the perforation of the plate, and terminates just above the lime in the platinum dish.

Distillation with 5 C.c. of methyl alcohol is repeated several times, ten such treatments being ample for all likely cases. Fewer are generally quite sufficient. A gelatinous mixture is obtained in the platinum dish. It is well stirred and allowed to stand for some minutes. It is then evaporated in an oil bath, and is finally heated over the blowpipe flame to constant weight. The increase of weight is boric acid, and the error does not in any case amount to more than 1 Mgm. plus when dealing with from 0.1 to 0.25 or 0.3 Gm. of anhydrous boric acid. To make sure that the acid has been completely volatilized, the residues in the distillation flasks are tested with turmeric paper. The few drops of water added before the first distillation greatly increase the rapidity of the removal of the boric acid. The use of nitric acid is not advisable for the purpose of freeing the boric acid in the flask. Acetic acid presents no difficulties and is quite effective.—*The Analyst*, December.

Testing of Hydrometers.

The German Government, through its Bureau of Standard Weights and Measures ("Kaiserliche Normalaichungs-Kommission"), is about to undertake the testing and certification of hydrometers or areometers which may be submitted for this purpose, of course for a certain fee (which will be moderate). For the present the tests will be confined to the use of hydrometers in certain specified liquids, since it involves too much work to determine the curve of capillarity for a great variety of liquids into which the instruments may be placed.

Precaution in Carbonic Acid Determinations.

IN the determination of carbonic acid in carbonates by finding the loss of weight after driving the gas out of a known weight of the salt, it is customary to use either sulphuric or hydrochloric acid for decomposing the carbonate, and sulphuric acid for drying the gas. The apparatus, of which there are many forms, is well known. The most simple form is this: The carbonate to be decomposed is put into a small flask with a little water, and this connected by glass tubing with a second flask containing sulphuric acid; the whole, as thus connected, is then weighed. A little of the sulphuric acid is then aspirated over into the first flask, and the generated gas then makes its way through the second glass tube into the first flask, where it has to pass through the sulphuric acid, and escapes in a dry state.

When hydrochloric acid is to be used for decomposing the carbonate, which is preferable in the case of the lime salt or others forming insoluble sulphates, a special receptacle must be provided for this acid, since the sulphuric acid in the other flask cannot well be dispensed with, it being required as a drying agent. A stoppered globe funnel with narrow tube forms a good receptacle. By gently opening the stopcock of the funnel, acid will gradually reach the carbonate until it is completely decomposed.

Borntraeger found some time ago (*Zeitsch. anal. Chem.*, 1890, 141) that when hydrochloric acid is used for dec omposing carbonates, losses are occasionally incurred by the escape of vapors of hydrochloric acid or chlorine which the sulphuric acid sometimes fails to retain. For this reason he prefers nitric acid as a decomposing agent, since all nitrogen compounds which may arise from a decomposition of the nitric acid will be retained by the sulphuric acid.

The Search for Mercury in Toxicological Examinations.

M. T. LECCO has found that the usual method used for destroying organic matter in toxicological examinations —viz., heating the organic organs, etc., with hydrochloric acid and potassium chlorate—does not, as has been supposed, also cause solution of any mercury which may be present, except under certain precautions.

A stomach in which the presence of metallic mercury could be plainly recognized by the naked eye was treated with potassium chlorate and hydrochloric acid in the usual manner until all organic matter was destroyed. The resulting solution, after being deprived of excess of interfering matters, was tested for mercury, but not a trace was found to be present or to have entered into solution. In fact, the mercury was found, in globules, in the residue which had remained behind. The only way by which complete solution of the mercury can be accomplished is to continue the action of the acid and the chlorate, with gentle heat and repeated stirring, for several hours.—After *Berichte*, 1891, 928.

Melting Points of Quinine, Cinchonidine, and their Isomers.

O. HESSE has repeated his determinations of the melting points of these substances (*Ann.*, 135, 327; 176, 207), using Roth's apparatus (*Ber.*, 19, 1970).

Anhydrous quinine, obtained by drying the trihydrate over sulphuric acid and heating to 115° or 120°, melts at 171.2°–172°; when obtained by heating the benzene compound $C_{20}H_{24}N_2O_2.C_6H_6$ to 120°, it melts at 171.6°–172°. The anhydrous isomeride formed by the prolonged heating of solutions of quinine in dilute alcohol, etc., at 30°, and which may be termed quinine anhydride, or homoquinine, melts at 174.4°–175°. It is reconverted into quinine by the prolonged action of dilute sulphuric acid.

Cinchonidine melts at 202°–202.8°, and is readily converted into its isomeride homocinchonidine, which melts at 207°–208.2°. The latter may be reconverted into cinchonidine by repeated crystallization from dilute sulphuric acid (*Ann.*, 205, 194).

The beta-cinchonidine obtained by the author by the action of hydrochloric acid on cinchonidine (*Ann.*, 205,327) melts at 206°–207°, but acquires a brown coloration. In an acid solution it polarizes more strongly than homocinchonidine; the sulphate resembles the homocinchonidine salt, and may be similarly converted into the cinchonidine compound, but it is more soluble in water.

It may, therefore, be assumed that the first product of the action of hydrochloric acid (sp. gr. 1.125) upon cinchonidine at 140° consists of homocinchonidine, which is further partially converted into apocinchonidine.

In the presence of concentrated sulphuric acid, only the first change takes place.—After *Annal.*, in *J. Soc. Chem. Ind.*

Recent Official Tests for Quinine Sulphate.

THE last German Pharmacopœia (published in 1890) gives the following tests for other cinchona alkaloids:

Upon 2 Gm. of sulphate of quinine, completely effloresced at 40° to 50° C., and contained in a test tube, pour 20 Gm. of distilled water, and place the whole during half an hour into a water bath warmed to 60° to 65° C., frequently shaking. Then transfer the tube into water of 15° C., and keep it there during two hours, frequently agitating. Then filter through a filter made of the best paper, 7 Cm. in diameter, transfer 5 C.c. of the filtrate (at 15° C.) into a dry test tube, and gradually mix it with water of ammonia (specific gravity 0.960) until the precipitate first produced is redissolved. Not more than 4 C.c. of water of ammonia should be used for this purpose.

Regarding this test, which is that proposed by Kerner and Weller, one of the commentaries on the new German Pharmacopœia makes the following comments ("Kommentar zum Arzneibuch f. d. Deutsche Reich.," von Hager, Fischer u. Hartwich, page 459):

The maximum consumption of ammonia, viz., 4 C.c., which the test permits, is so close that it justifies the conclusion that the authors of the work intended to recognize as official only a perfectly pure sulphate of quinine, although we are inclined to doubt the actual attainment of this object in view of the facts presently to be mentioned.

Chemically pure sulphate of quinine, which is prepared from the bisulphate after the latter has been several times recrystallized, when subjected to this test yields a filtrate, of which *the first five* cubic centimeters require from 3.3 to 3.8 C.c. of ammonia, *the amount depending upon the nature of the filter paper used.* The second 5 C.c. of filtrate will require from 3.8 to 4.1 C.c. of ammonia. What is the reason of this? Simply that sulphate of quinine is absorbed by filter paper from aqueous solution, in varying ratio, according to the thickness or filtering capacity of the filter paper. From the second 5 C.c. which pass through the filter, the paper, which is already saturated by quinine abstracted from the first 5 C.c., will take up less of the alkaloid. Hence more ammonia will be required for the second 5 C.c., and the actual amount will often be more than the limit allowed by the Pharmacopœia, which throws a doubt upon the latter.

Schaefer, who was the first to point this out, showed that it is possible to deprive a saturated solution of quinine sulphate entirely of the alkaloid by passing it through several layers of filter paper, so much so that a drop of ammonia, when added to the filtrate, will not even produce a cloudiness. Hence Schaefer recommends to use glass wool in this case as filtering medium, since this has no selective tendency towards alkaloidal salts.

If glass wool is substituted for filtering paper, the first 5 C.c. of filtrate obtained in the official test will require from 4 to 4.3 C.c. of ammonia. The variation in the amount of the latter is probably due to the occasional partial supersaturation of the solution, remaining after the latter has cooled.

It would have been preferable had the Pharmacopœia directed filtration through glass wool, and directed 4.5 C.c. of ammonia as upper limit.

Great care must be taken that the temperature of 15° C. is maintained during the filtration (and addition of ammonia). An elevation of 1° C. may cause an increase in the consumption of ammonia amounting to 0.2 and 0.3 C.c.

While the test is subject to circumstances sometimes requiring a considerable increase in ammonia, it is, on the other hand, rather uncertain when only small quantities of cinchonidine are present. A few percents of the total cinchonidine which had crystallized, together with the quinine salt, are as good as passed over by the test.

Nevertheless, if the directions are carefully observed, it is more sharp than that of the last Pharmacopœia.

The Use of Sodium Sulphide in Place of Hydrosulphuric Acid Solution.

DR. HERMANN KUNZ recommends the use of sodium monosulphide, in crystals, $Na_2S.9H_2O$, as a substitute for hydrosulphuric acid solution, particularly when the employment of the latter is inconvenient. It happens frequently that a test is to be made when none of the solution is ready at hand; or tests are to be made at a moment's notice during a journey or expedition.

For use the author recommends to prepare a 50-percent solution of the salt in water. Each cubic centimeter of this corresponds to about 40 C.c. of hydrosulphuric acid gas. In place of an aqueous an alcoholic solution may be prepared, when this is preferable.

In applying the reagent, 1 drop of the solution is diluted with about 1 C.c. of distilled water, in a test tube, and the liquid to be tested added to it. If the sulphide to be precipitated forms only in a neutral or alkaline solution, and it should not at once make its appearance, it is only necessary to add a few more drops of the reagent, which has itself an alkaline reaction. If the precipitation can take place only in an acid solution, the liquid to be tested is to be previously acidulated with a few drops of acetic acid. In the case of arsenic the liquid must be acidulated with hydrochloric acid, and the appearance of the precipitate may be hastened, as usual, by placing the test tube into hot water.

While the above-described reagent thus renders valuable service in qualitative work, it is not so universally

applicable for quantitative work, since it introduces fixed bases which would often interfere with the object of the analysis. But when the object is one where the introduction of sodium or the presence of a little free sulphur, perhaps, is of no account, it may be used—for instance, when lead is to be tested for and to be separated as sulphide.—After *Pharm. Centralh.*

Redetermination of the Specific Gravity of Nitric Acid of Varying Strength.

KOLB'S table, which has usually been followed up to the present time, has repeatedly been criticised as being incorrect, particularly in its upper values. Even the method used by Kolb in determining the strength of any sample of the acid—which consists in saturating the whole contents of the specific-gravity bottle with an excess of pure calcium carbonate, and weighing the undissolved portion—is now recognized as not furnishing absolutely reliable data. In view of these facts, and having already revised the corresponding tables of sulphuric and hydrochloric acids, Prof. Lunge, this time in conjunction with Mr. H. Rey, redetermined the curve of specific gravity relating to percentage of absolute acid, and from this constructed a new table, which will, no doubt, hereafter be followed until perhaps a still more exact determination may be made.

We give a selection of figures, such as will be useful in practice, from Lunge's new table:

Specific gravity at 15° C.*	100 parts by weight contain		1 liter contains in kilos,
	N_2O_5.	HNO_3.	HNO_3.
1.000	0.08	0.10	0.001
1.005	0.85	1.00	0 010
1.010	1.62	1.90	0.019
1.025	3.94	4.60	0.047
1.050	7.71	8.99	0.094
1.075	11.27	13.15	0.141
1.100	14.67	17.11	0.188
1.125	18.00	21.00	0.236
1.150	21.29	24.84	0.286
1.175	24.54	28.63	0.336
1.200	27.74	32.36	0.388
1.225	30.88	36.03	0.441
1.250	34.13	39.82	0.498
1.275	37.41	43.64	0.556
1.300	40.71	47.49	0.617
1.325	44.17	51.53	0.683
1.350	47.82	55.79	0.753
1.375	51.69	60.30	0.829
1.400	55.97	65.30	0.914
1.405	56.92	66.40	0.933
1.410	57.86	67.50	0.952
1.415	58.83	68.63	0.971
1.420	59.83	69.80	0.991
1.425	60.84	70.98	1.011
1.430	61.86	72.17	1.032
1.435	62.91	73.39	1.053
1.440	64.01	74.68	1.075
1.450	66.24	77.28	1.121
1.475	72.39	84.45	1.246
1.500	80.65	94.09	1.411
1.520	85.44	99.67	1.515

The original table of Lunge's is much more in detail than the above. We have selected only those figures which are of special importance in practice. Kolb's table does not give the values for 1.420 (specific gravity of nitric acid, according to the U. S. Pharm. of 1880), but contains those for 1.412 and 1.426, from which the value for 1.420 was calculated. It was put into the text of the U. S. Ph. (page 17) thus: A liquid composed of 69.4 per cent of absolute nitric acid and 30.6 per cent of water. According to Lunge's table, these values ought to be 69.8 and 30.2, respectively. The fact that Lunge's figures are calculated as having been weighed *in vacuo* does not affect the practical use of the table.—After *Zeitsch. f. angew. Chemie.*

* Compared with water at 4° C., and calculated as being weighed in vacuo.

Volumetric Assay of Potassium Permanganate, Peroxide of Hydrogen, and Chloride of Lime.

G. LUNGE, in a recent paper (*J. Soc. Chem. Ind.*, 9, 21), only treats of those of the numerous uses of the nitrometer in which hydrogen peroxide is employed as the principal reagent; and although the methods he refers to have been previously mentioned, the paper in question gives such data as amount to a conclusive proof of the correctness of the results to be obtained by this analytical method.

1. *Standardizing Potassium Permanganate with Hydrogen Peroxide in the Nitrometer.*—In this case it is necessary to work with acid solutions containing a large excess of sulphuric acid. The permanganate employed was made from pure crystals, and was as nearly as possible semi-normal, namely, 1 C.c.=0.004 Gm. of oxygen. It was standardized with iron wire; with crystallized oxalic acid, purified according to Winkler's process and dried to constant weight in a Victor Meyer's air bath at 56°; and with ordinary commercial hydrogen peroxide.

The results were as follows:

With iron wire.....1 C.c. = 0.003999 Gm. oxygen
With oxalic acid.....1 C.c. = 0.003997 " "
With hydrogen peroxide...1 C.c. = 0.004002 " "

For 10 C.c. of permanganate, 30 C.c. of dilute sulphuric acid (1 : 5) and 10 C.c. of hydrogen peroxide should be used. The above numbers show that the standardizing with hydrogen peroxide in the nitrometer is one of the most accurate methods, having the great advantage that it is carried out within an extremely short time without requiring a standard substance of accurately known composition.

2. *Estimation of Bleaching Powder or Bleach Liquor by means of Hydrogen Peroxide in the Nitrometer.*—The reaction which takes place is as follows:

$$CaOCl_2 + H_2O_2 = CaCl_2 + H_2O + O_2.$$

It is not necessary to know the exact composition of the reagent, but, as it is desirable not to employ too large an excess, it is best to make a rough preliminary test by titrating the hydrogen peroxide with an excess of bleach solution.

For analysis, the reagent should be diluted before use, so as not to give out more than 7 C.c. of oxygen per cubic centimeter, and it must be made distinctly alkaline with sodium hydroxide up to the point at which a flocculent precipitate appears. The reading should be effected quickly—say five minutes after mixing the liquids—otherwise the results will be too high, owing to the gradual evolution of more oxygen from the alkaline liquid. In order to find the percentage of available chlorine by weight, it is necessary to remember that every cubic centimeter of gas evolved, reduced to 0° and 760 Mm., represents 0.003167 Gm. of chlorine. In practice it is best to dissolve 7.917 Gm. of bleach in 250 C.c. of water and use 10 C.c. of the solution for each test, when every cubic centimeter of oxygen evolved will directly indicate 1 per cent of available chlorine.

This involves the use of a 50 C.c. nitrometer. It is shown that the estimations are just as accurate when water is employed in the nitrometer as when using mercury. From the results of a large series of comparative tests, the author infers that the nitrometric method yields quite as concordant results in the testing of bleach as Penot's method, although by the former process there is about 0.2 per cent more chlorine found, and this amount might be deducted as a constant from the nitrometric results to bring them into entire concordance with those obtained by Penot's method.—After *J. Chem. Soc.*

Oxycyanate of Mercury.—Hydrargyrum oxycyanatum, HgO(CN), is another addition to the already long list of mercurial compounds (*Pharm. Zeit.*, April 15th, p. 241). It is recommended by Dr. Boer as surpassing mercuric chloride in antiseptic properties, and is said not to coagulate albumen, to exercise only a faint caustic action, and not to attack instruments so readily as corrosive sublimate.

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EDITORIAL.

THE SIZE OF A DROP.

THE paper of Mr. Philips on the first page of this issue will be echoed from the experience of every one who has worked at the prescription counter; but it must be acknowledged that it relates to an evil the existence of which is more apparent than its remedy.

It may not be impracticable for some authoritative body, like the American Pharmaceutical Association or the Committee for Revising the Pharmacopœia, to recommend or adopt a form of drop-former which may serve as a standard, and which may, in a degree, lessen the elements of uncertainty; and, although not capable of eliminating them entirely, it may reduce the limits of variation so far as affected by the form and material of the instrument used.

It will be readily understood that the variations in the fluidity and the weight of the liquid to be measured will still exist as a disturbing factor, and that an approximate degree of accuracy only will be the best obtainable result, even were a standard drop-former used in every case.

Moreover, it is extremely doubtful whether it will be possible to abolish, to any great extent, the use of the drop as a measurement by prescribers. If this *could* be done, and if, in dose tables, minims could be substituted for drops, and manufacturers were to make use of minims in the directions given by their labels, then the trouble would practically cease. So, too, one might say that if the millennium were to come we should be better off in numerous ways. As yet one is about as likely to occur as the other.

As a matter of fact, prescribers regulate dosage less according to conventional usage than by the effect produced or desired in a particular case; and in the use of an active remedy, like gelsemium, for example, they expect it to be taken until its effects are manifest. It may be that two or three doses will suffice, or it may be a dozen; and, unless the single dose is evidently so large as to be dangerous, it may be a gratuitous service on the part of the dispenser to concern himself about the effects which *might* follow the use of the entire quantity, when it does not seem to have been of importance to the prescriber. The fact that directions of the prescription provide for repetition of doses at stated intervals does not necessarily imply that the entire number of doses is to be consumed without intermission.

If a standard drop-former were to be adopted by the Pharmacopœia, there would still be doubt in some cases whether the prescriber intended the particular quantity which it would give, or the conventional drop of the haphazard variety, and the dispenser would still be but little better off than before, excepting the existence of a standard upon which he could rely in case of trouble. In the event of the adoption of a standard instrument, there would arise the necessity for establishing a standard for the number of drops equivalent to a certain number of minims for every liquid galenical in use, which would also have to be incorporated into the Pharmacopœia, so far as these articles are made official.

The subject is certainly one worthy of consideration, and we hope that Mr. Philips' remarks may elicit an expression of opinions and suggestions by others.

SYNTHETIC MUSK.

SOME interesting information concerning this new commercial product has recently been received from Mr. W. P. Ungerer, an authority in matters relating to perfumes. This substance results from a reaction of nitric and sulphuric acids in the presence of isobutyl-toluene according to a process patented by Trudel and Crafts. It has the form of acicular white crystals, becoming yellow by exposure to light, and has a strong musky, nitrous, cinnamic odor, reminding one of the odor of Ambrette seed (*Malva moschata* Lin.), and the excrement of the marten. It is fusible at 110° F., soluble in alcohol and ether.

While Mr. Ungerer considers the discovery of artificial musk to be very important and likely to result in great commercial value and usefulness, it is probable that the idea which many people have that it will take the place of natural musk must be considerably modified as a result of experience in its use. It is especially desirable that experiments should be made to show the effect of its combination with such other substances as are used in the manufacture of perfumes and toilet soaps, since these combinations furnish a more reliable test of its value than the simple method prevailing among perfumers of judging by the odor given by blotting paper moistened with a solution or tincture. Mr. Ungerer's experiments thus far show the disappearance of the odor of synthetic musk in the presence of benzoated tallow, soapstone, chalk, cacao butter, Peru and Tolu balsams, and all fatty acids. He thinks that a considerable limitation of its usefulness will result from its paralyzing influence upon the olfactory nerve and its remarkable tendency to assert itself and overpower all other odors and destroy their combinations. It has an unfortunate disposition to stand alone without blending—or "marrying," as perfumers express it—with others, as is likewise the case with the amorphous precipitate called Neroline, which has caused it to be a failure in the hands of perfumers.

Another fact noted by Mr. Ungerer is the absence of by-products. In the case of natural musk the odor is almost inexhaustible, and the substance not only yields by percolation a second and third tincture, but the dried residues are available for sachets, toilet powders or soaps. Perfumers have come to depend largely upon this valuable property of natural musk, and look to it as a necessity for lucrative manufacturing.

A reliable quotation on this new product is derived from Messrs. Schimmel & Co., who state, in a recent semi-annual report, that "opinions of the artificial musk are still very divided; so far as our experience goes, the majority of perfumers and soap manufacturers are disinclined to have much to do with it, and are satisfied, with experiments already made, that artificial musk of the present quality is not suitable for fine perfumery and will not displace the natural musk. So much may be accepted as certain, and its victories must be looked for in another field."

Mr. Ungerer believes that further examination of various preparations is necessary before decisive judgment can be reached in either direction. The quality of artificial musk at present leaves much room for improvement, and it may safely be assumed that a much more finished product than the present will sooner or later appear in commerce. Various unsatisfactory properties of synthetic musk, particularly the yellowing of the substance or its solution upon exposure to light, seem to indicate that the product has not yet attained the level of purity.

One of the largest perfumers of Paris, who was among the first to undertake the trial of synthetic musk, has said:

"Every perfumer will try it; but the fact is that the invention is a scientific one only, and, so far as demonstrated in my experiments and those of many others who were as enthusiastic as myself over the new discovery, we are satisfied that the new alleged substitute for musk is doomed."

The Action of "Leech Extract" upon Blood.—Haycraft has shown that the "extract" prepared from the anterior part of the medicinal leech contains some agent which has a strong anti-clotting action upon blood.

The "extract" described by him is neutral to litmus, and contains a proteid which appears to be albumose. At all events, the albumose precipitated by ammonium sulphate has all the anti-clotting power of the original extract, and the extract minus the albumose has no such power.

Admixture of this extract to blood prevents it from coagulating.—After *Journ. Chem. Soc.* [It is, no doubt, due to this very agent that leech bites often bleed so persistently after the leech has been removed.]

Solubility of Iodoform in Olive Oil.—The solubility of iodoform in the fixed oils is stated somewhat variably. Squire gives 1 in 30 of olive oil; Martindale "1 in 60 of vaseline and oil of almonds, and about the same in fats and other fixed oils."

F. Klingmann (*Apoth.-Zeit.*, 1891, 70) has recently determined the factor with care. Five Gm. of iodoform were added to 30 Gm. of olive oil, the whole being shaken for twelve hours by means of a small turbine. Then it was filtered, and the saturated oil was found to contain between 2½ and 3 per cent of iodoform. With due allowance for specific gravity, this shows the solubility of iodoform to be 1 part in 39 fluid parts of olive oil.—*Chem. and Drugg.*

Window Polishing Paste.

Prepared Chalk	90 parts.
White Bole	5 "
Armenian Bole	5 "

Rub together into a smooth paste with

Water	50 parts.
Spirit	25 "

The paste is to be rubbed on the window, allowed to dry, and then rubbed off with cloths.—DIETERICH, after *Chem. and Drugg.*

CORRESPONDENCE.

A LETTER received from Mr. H. W. Snow requests the insertion of the following:

[On page 156, near the top of the first column:]—In 1883, C. G. Wheeler presented to this Association a paper in answer to the query, "Is the citrate of caffeine in the American drug trade a mixture?" I cannot fully coincide with the conclusions he has drawn, in so far as they bear on the question of the existence of a true citrate of caffeine. Quantitative methods alone, as used by Wheeler, do not prove anything so far as this particular salt of caffeine is concerned, and recourse must be had to physical properties, as solubilities, melting point, subliming point, etc. Mr. Otto Scherer, in a paper on this subject, concluded that four out of five samples of commercial citrate examined by him were simply pure caffeine, containing no citric acid whatever, while the fifth contained about 50 per cent of caffeine, yielded only a trace of caffeine to chloroform when treated dry and melted at 160° to 161° C., whereas the first four samples melted at 224° C., and a sample of citrate made by Lloyd's process fused at 159° C. The chloroform test in itself would be sufficient evidence of the genuineness of this particular salt. The proportion of caffeine found (45 per cent) showed the salt to correspond very nearly to one molecule of alkaloid to one molecule of acid (50.3 per cent of alkaloid), or the most acid of the three salts of caffeine and citric acid. Mr. Scherer's paper is also valuable for the numerous references it gives to the literature of caffeine citrate.

Coloring Coal Oil Red.

DEAR SIR:—Replying to Query No. 2,525 in May issue of AMERICAN DRUGGIST, I would state that a very simple and satisfactory red coloring of coal oil may be effected by alkanet root. Two pounds of ground alkanet root are sufficient to give a beautiful shade of red to one barrel of oil. It should stand a day or two, and be occasionally agitated. Different shades of red may be produced by using more or less of alkanet, and may easily be tested on a small scale in ordinary bottles. With much respect,

Yours truly,

NATHANIEL R. BRADNER, M.D.

PHILADELPHIA, PA.

Hypnal.

WILL any of our readers investigate and reply to the following?—ED. AMER. DRUGG.

Ed. American Druggist.

DEAR SIR:—In your journal for May 1st you give directions for preparing "hypnal." I tried the process, with no better result than to spoil valuable medicines. I followed directions exactly. After mixing the two solutions the liquid separated into two layers—a clear supernatant liquid, and an oily layer at the bottom of the funnel. I separated the liquids, set them aside, expecting the oily liquid to crystallize; it has been four days since I made the experiment, and no sign of crystallization has occurred in either. What is the matter?

Respectfully, M. A. B.

MARSHALL, MO., May 16th, 1891.

Tooth Wash.

A SAMPLE of tooth wash sent us for examination, and supposed to contain saccharin, has turned out to be absolutely free from it. The sweet taste is due to glycerin, sugar, and partly, also, to the small amount of chloroform present. A close imitation of it may be made as follows:

Tinct. Quillaja (Nat. Form.)	10 fl. oz.
Glycerin	10 "
Aromatic Elixir (N. F.)	10 "
Chloroform Water	3 "
Tinct. Myrrh	2 "
Talcum	q. s.
Tinct. Lavender Co	1 fl. oz.

Mix the first four liquids, add a little talcum, mix well, and filter. To the filtrate add the compound tincture of lavender.

A preparation similar to the above is much in use in this city.

NEWS AND NOTES.

ENGLAND.

WE are just beginning to feel the return of "*la grippe*," or, as it is more commonly called, influenza. Already large firms are depleted of several members of their staff, and, although it does not appear so virulent and widespread as last year, yet it is spreading on all sides. A month ago it appeared first at Hull, and quickly spread through the densely populated manufacturing districts of Yorkshire and the adjoining counties. Only within the last week or two has its presence been felt in London. Several of the wholesale houses have issued, with characteristic promptitude, circulars to the trade and medical profession, respecting their "influenza mixture," chiefly, I believe, consisting of acetate of ammonia, aconite, quinine, etc. Chemists generally have been exhibiting notices respecting the value of quinine, antipyrin, etc., in cutting short an attack.

A West End firm has sold during the last two or three weeks over four gallons of the ammoniated tincture of quinine across the counter in 2-oz. bottles at 36 cents. This has been chiefly in request as a prophylactic, and it is again a noticeable feature with regard to this epidemic that the fashionable and aristocratic quarters have suffered most.

Medical practitioners state that the symptoms were identical with those of last year; but there is more pneumonia and bronchitis than before. Most of them agree that in the first stage aconite, antipyrin, and acetanilide are of great value, whilst subsequently quinine and tonics are advisable. On the other hand, a prominent physician, Dr. Mortimer Granville, has written to the *British Medical Journal* to explain that all this treatment is wrong, and that his method is alone scientific. He states that the fever, which is invariably present, should be overcome by tonics, and not by depressants such as antipyrin, or even quinine. Referring to his experience with the epidemic of 1847, he affirms that he found that diffusible stimulants, such as camphor and ammonia, succeeded when febrifuges failed or did harm. He used these remedies, especially the former, last year, and this year again, and, although he has met with a large number of cases with extraordinarily high temperatures, this treatment has not failed.

It is not very long ago since this same physician suggested a "concentric pill," which was made at his request and charged at 12 cents *each pill*. The following was the brilliant idea: One grain pill of aloin was made and coated with tolu varnish; then one grain of extract of cascara was wrapped round this, and a keratin varnish applied; finally the pills were moistened with mucilage, and rolled in finely-powdered iridin, by which means they were supposed to each take up one grain of that resinoid body. It was supposed that by this means all the value of three pills would be obtained in one, as each coating was expected to dissolve in either the stomach or the intestines. Needless to say, the idea is exploded. Since then he has suggested a cure for cancer, depending upon thalline, or a derivative of it, whilst his prescriptions are a marvellous sight to see.

Now the revision of the U. S. Ph. is in progress, would it not be an improvement to direct that iodoform ointment should be made by melting the benzoinated lard and adding the iodoform, rather than in the cold as now directed? Any one who has made it by the two methods would notice at once the difference in consistence of the two ointments. The one made by heat is fairly hard, some of the iodoform having been dissolved, whilst the U. S. Ph. method gives a very soft product.

No progress can be reported of the Pharmacy Bill, which is before Parliament; it has merely roused the resentment of one or two honorable members, who have savagely announced their intention to oppose it. There is a general opinion abroad that opposed business stands very little chance this session.

The Pharmaceutical Society, however, is rousing itself to adequately carry out the celebration of the jubilee of its existence. The annual meeting takes place on the 27th, and a vote will be taken upon the subject of increasing the stringency of the preliminary examination, which at present only embraces the three subjects of Latin, arithmetic, and English grammar. In the evening a conversazione will take place at the Society's houses, 16 and 17 Bloomsbury Square, and addresses of congratulation will be read. On the next evening a gastronomical function takes place at the Criterion Restaurant, and some 200 to 300 guests are expected to be present.

A company has recently been formed here to exploit a so-called new drug, a substitute for quinine. Under the name of Kreat Halviva, the Halviva Company have made some stir with their remedy, and already several doctors have given them the usual flowing testimonials. It now appears from the statement of Mr. E. M. Holmes, F.L.S., Curator of the Pharmaceutical Society's Museum, that Kreat is only an old Indian term for a species of chirata, closely allied to, if not identical with, *Ophelia chirata*, which has been an official drug for many years. These medical men will feel slightly crushed when they learn that their new remedy is only a preparation of chiretta.

London Market Report.

MINCING LANE, May 13th, 1891.

There has been a fair amount of business transacted during the last month, but prices have only maintained their level in most instances. Heavy chemicals have been firm, with considerable inquiry, but sulphate of copper is quite unsalable. Quinine has advanced a shade, and prices seem firm, the last cinchona auction showing a better demand. Opium has been very easy lately, but shows signs of stiffening. Advices from Smyrna state that dealers have been more anxious to realize, and American buyers are credited with having obtained the lowest rates recorded this year. The sales last month at Smyrna were over 450 cases at prices ranging from 1.92 to 2.84 per lb. Ipecacuanha is firm, and a small rise has taken place in shellac.

The following are current prices:

Acid, citric	per lb.,	0.41	Balsam Peru	per lb.,	1.7
tartaric	"	.29	Cascara	"	.06
oxalic	"	.07	Cinchona, Indian.	"	.08 to .16
Cream of tartar.	"	.21	S. American	"	.17
Arsenic	per cwt.,	3.18	Ergot	"	.28
Bleaching p'wd'r	"	1.92	Ipecacuanha	"	1.92
Copper sulphate.	"	3.3	Jalap	"	.30
Chlor. of potash.	per lb.,	.11	Oils, linseed	per cwt.,	5.24
Cyanide, pure	"	.50	cotton	"	5.36
Bichromate	"	.07	turpentine	"	7.30
Mercury	"	.44	aniseed	per lb.,	1.5
Calomel	"	.76	petroleum	per gall.,	.11
Corrosive sub.	"	.60	cassia	per lb.,	.84
Soda, caustic	per cwt.,	2.58	peppermint, H.G.	"	3.0
bicarbonate	"	1.74	Opium	"	2.5 to 2.76
			Shellac, TN.	per cwt.	1.72

CANADA.

THERE is little of interest to the trade to record at present beyond the coming election of officers of the council for the Ontario College of Pharmacy. Business is excessively flat. Drug clerks are getting wary and making fewer mistakes. Suicides are not so common; then what has one to write about?

Under the new system of distribution to secure representatives in the council of the Ontario College, Toronto is entitled to two members. There the selection has taken the form of a regular political campaign, with its campaign literature rife with accusations against the opposing party, personal canvasses and caucuses. The high party feeling there has led the adherents of each side to bring out two candidates. Mr. C. D. Daniels for the Eastern Division, and Mr. J. H. Mackenzie for the Western Division, will uphold the present council; while Mr. A. Jeffrey for the Eastern, and Mr. Gibbards for the Western Division, will advocate Mr. Shuttleworth's cause.

Each side is throwing obstacles in the way of the other and making all the difficulties possible. A special meeting of the council was called on the 28th of April, ostensibly to consider plans and specifications for the proposed addition to the college building, about which matter there could be no necessary haste. However, this

business was gone through with, not without opposition on the part of some of the members, who do not consider it wise to increase the liabilities and expenses of the college beyond the absolute requirements. Then the question of engaging the new staff of teachers for a term of years was brought up and carried through, much to the disgust of the adherents of the old staff. This makes a still more complicated condition of affairs, and I am afraid much legal advice will be appealed to before it is smoothed out. If the present council has the power to make arrangements for any length of time, the college will be under the absolute control of this new staff of teachers, who may do as they wish for two years at least; and, should they abuse their authority, may make things decidedly unpleasant.

The students are all in favor of Mr. Shuttleworth, as testified by a presentation on the closing of the school for the session. After many kindly and laudatory sentiments were expressed by the students, and hopes for the speedy and happy termination of the troubles, Mr. Shuttleworth was presented with an oxidized-silver reading lamp, Mr. Avison with a silver oyster tureen, and Mr. Harrison with a set of carvers.

Unless an agreement is come to soon, there will be a complete disrupturing of the confidence existing in the trade in Canada, and I very much fear cutting and attendant demoralization will complete the series of disasters inaugurated by the present hard times.

At a meeting of the druggists of District Association No. 10 (Norfolk, Oxford, and Perth), held in Woodstock on May 15th, the present representative, Mr. J. J. Hall, of Woodstock, was unanimously chosen as the representative for this district, and resolutions were passed indorsing the record and platform of the council of the college as set forth in their circular, and pledging the members of the association to support the council in their undertakings; requesting the council of the college to enforce clause 23 of the Pharmacy Act, which establishes the standard and provides against adulteration of the preparations of the Pharmacopœia, as certain jobbing and manufacturing chemists are selling such preparations to the medical profession that are not up to the standards, thereby destroying confidence in the efficacy of medicine; pledging the association to discourage the sale of morphia and opium, except upon a doctor's certificate, and all patent medicines that do not allow the retailers a fair margin of profit; the giving of free samples, the purchase of exclusive agency to get the benefit of advertising, and recommending each town and city to unite on these lines.

A meeting of the Pharmaceutical Association of Hamilton District was held May 8th. After a quorum was proved and some unimportant business connected with the changing of prices was transacted, a resolution was passed approving of the action of Mr. J. A. Clark as a member of the council, and desiring the placing on record of their appreciation of his services in protecting the interests of the college and advancing the standing of the profession, etc., etc., nominating him as a candidate for re-election and pledging themselves to aid in his election.

As it was desirable that the motion should be unanimously approved of by the members of the association, a copy was circulated the day following among the druggists who were not present at the meeting, and received the signatures of the majority of the druggists in this district.

At a meeting of the Elgin and Middlesex Association, held in St. Thomas, a resolution was carried condemning the course pursued by the present council and approving of the action of their representative, Mr. L. T. Lawrence, as well as Messrs. D'Avignon, Jeffrey, Walters, and Sanders, and nominating Mr. Lawrence for re-election.

The Ontario and Durham Association, meeting in Oshawa, passed a resolution unanimously disapproving of the present council, and pledged themselves to support Mr. I. S. Kyley at the coming election.

The fourth semi-annual examinations of the Ontario College of Pharmacy were opened in the rooms of that institution at nine o'clock on Monday morning, May 11th, at which one hundred and ten students presented themselves.

KANSAS CITY.

U. V. WINGFIELD has enlarged his stock at Shackelford, Mo.

HARLON WHITE has increased his already large stock of drugs at Drexel, Mo.

MR. LAFORCE, of Adams & Laforce, Smithville, Mo., has lately visited Kansas City.

C. V. RINGS, of Parkville, Mo., visited us on business the 9th.

V. A. BARNES, of Winchester, Kan., bought drugs here on the 8th.

E. E. ANDERSON, of Garland, Kan., was a guest of the Pacific House a few days since.

J. T. FRITZLER has succeeded C. D. Cravens at Prathersville, Mo. Success to his new venture!

J. T. ANDERSON, the enterprising young business man and druggist of Buckner, Mo., was in the city on the 1st.

J. A. JACKSON, after spending a few days with us, has returned to business at Nevada, Mo.

ANTHONY MUELLER visited this city from that town of rock houses—St. Mary's, Kan. It's not to be assumed that he comes from a "rocky" town.

HENRY ADAMS bought new drugs last week to recuperate his mammoth store at Spring Hill. He says business is fair in his district and the rains are helping it along.

H. J. BARR, of White City, Kan., showed his pleasant face on our streets for several days last month.

SPENCER E. SCOTT is with Dr. Herbst at Twelfth and Charlotte Streets.

The Kansas State Pharmaceutical Association met at Ottawa on the 19th, 20th, and 21st. A full account will appear in our next issue.

S. J. KEIFFER, who is one of the happy twenty-three who passed the Board of Pharmacy at the April meeting, is now at C. E. Corcoran's, Ninth Street and Troost Avenue.

None of our druggists were at the New Orleans meeting of the A. P. A. Several expressed a desire to go, but could obtain no concessions from the railroads.

H. B. SPARKS, PH.G., has returned from a visit to Parsons and Pittsburg, Kansas, where he has been the guest of parents and relatives. It is supposed he didn't join the Alliance, as he is back again at Tenth Street and Harrison.

Don't forget that the Missouri Pharmaceutical Association meets at Excelsior Springs, June 9th, 10th, 11th, and 12th. Kansas City will send a larger delegation than ever before. The fare from this city has been reduced to $1.25 for the round trip, including 'bus from the depot to the "Elms." A rate of $2 per day has been secured at the big hotel. Local Secretary L. D. Cravens has all arrangements completed and promises to make all comers feel at home.

S. S. MCINTYRE, who owns one of the most handsome drug stores in Clay Center, was visiting in the city the past week.

W. T. ELLIBRIT spent several days here this month looking after business interests. He is one of the foremost druggists of Higginsville, Mo.

MR. SMITH represented the equally well-known firm of Smith & Sons among our wholesale brothers last week. They are located at Raystown, Mo.

DR. ALVIN SNYDER, of Seneca, Kan., visits us these days very often. He is worthy of the pharmaceutical profession, even if he is a doctor.

B. STREATOR came from Durango, Col., to purchase goods from our wholesale trade. Kansas City wholesale druggists make hard competitors for Western patronage.

HAMILTON & STRAP is the name of the new drug firm at Orrick, Mo. Dr. Hamilton is a young physician who has been fortunate in his profession, and will, of course, have equal success as a pharmacist.

P. H. FRANKLYN, Secretary of the Missouri Board of Pharmacy, was up from Macon City this week and the guest of Wm. T. Ford, the Kansas City member of the

Board. We suppose the visit means business for candidates at the next meeting of the Board.

Articles were filed with the Recorder of Deeds of Jackson County, on the 9th of May, changing the name of the Meyer Bros. Drug Co. to Schulte-Lynn Drug Co., conveying the firm's property on Fifth and Washington Streets. The action is a mere formality, as the change in the business was made over a year ago.

The Executive Board of the Alumni Association of the Kansas City College of Pharmacy has issued cards for an old-fashioned dinner picnic at Washington Park, June 7th. This is the first of a series of social meetings to be held during the summer months. At its last meeting Miss Susie Holzinger was elected Secretary of the Board.

The Kansas City Pharmaceutical Association is after the dry-goods stores here which are cutting prices on proprietary articles. They have found where these cutters buy their goods (by the way, it is from wholesale drug houses in a neighboring city, not local ones), and have asked the various manufacturers to cut these wholesale houses off their list of customers, and in other ways to help them down the cutters. This Association has done more work that *counts* than all the other drug associations put together toward holding up the prices of proprietary articles, etc. Their work is not ready for publication till all their plans are completed, when they will surprise all our sister organizations with the magnitude and thoroughness of their work.

GEORGIA.

THE sixteenth annual meeting of the Georgia Pharmaceutical Association met in Augusta, May 12th, at Masonic Hall, and was called to order by President Goodwyn at 10:30 A.M. Local Secretary Smith gracefully introduced Mr. P. A. Stovall, who delivered the address of welcome in appropriate remarks, tendering the pharmacists the hospitalities of the city, which was pleasantly responded to in behalf of the Association by Mr. Harry Sharp, of Atlanta. Then came the address of President J. W. Goodwyn, of Macon, which was a valuable and interesting paper on the work and scope of the Association, and was received by closest attention of convention. This was followed by a paper submitted by Mr. S. C. Durhan, of Augusta, calling for a higher standard of pharmacy, which was a very able and interesting article. Second session was called to order at 3:30 P.M. by President Goodwyn. Election of officers being next in order, the following were elected: president, H. R. Slack, Jr., Lagrange; 1st vice-president, E. M. Wheat, Columbus; 2d vice-president, C. M. Crosby, Marietta; 3d vice-president, J. P. Smith, Augusta; treasurer, Mallory H. Taylor, Macon; secretary, H. H. Arrington, Summerville; local secretary, J. P. Turner, Columbus. The remainder of the session was taken up by reports of committees and answers to queries. The third session was had after a pleasant ride up the canal to the locks. The meeting was called to order by President Goodwyn at 11 A.M. George F. Payne, Chairman of the Committee of Awards, made his report, awarding first prize of $50, offered by L. W. Hunt, of Macon, for the best display of pharmaceuticals prepared by an assistant, to J. T. Oliphant, of Atlanta; and second prize of $25, by N. I. Brunner, Ph.G., Macon, to W. D. Burks, Lagrange. The following persons were selected whose names are to be presented to the governor, one of whom is to be appointed to fill a vacancy in Board of Pharmaceutical Examiners, caused by expiration of term of F. Joerger: George F. Payne, Atlanta; E. J. Kieffer, Savannah; J. P. Turner, Columbus; C. M. Crosby, Marietta; R. H. Laud, Jr., Augusta. At the fourth session, after transaction of routine business, the Association adjourned to meet in Columbus May 10th and 11th, 1892.

MICHIGAN.

DR. J. W. BEAN & SON'S drug store in Edwardsburg was burned to the ground early in the month. This is extremely unfortunate, as they had just refitted their store at considerable expense. The stock was entirely consumed, and as they carried no insurance they will suffer a loss of about $5,000.

ELI W. MOORE, brother of Druggist Moore, of Ann Arbor, has been appointed a member of the city Board of Health.

THE HANCOCK CHEMICAL WORKS were recently destroyed by fire. The entire plant was consumed, including the boarding house and office building. The loss will reach $20,000, the only insurance being on the boarding house for $1,500.

The third examination this year of the Board of Pharmacy was held at Ann Arbor, and the following were given certificates: Registered Pharmacists, F. Ashley, H. Briggs, Al. Hutchinson, E. N. Kennedy, J. B. Ostrander, S. B. Robby, J. B. Sutton, of Ann Arbor; H. L. Burd, Detroit; A. W. Adams, Chesaning; H. E. Allen, Morenci; L. M. Real, Richland; C. H. Bostwick, Manton; A. Campbell, Crystal Falls; J. E. Carnoty, Watervliet; F. M. Chapel, Grand Blanc; H. J. Connell, Belding; S. A. Irwin, Leslie; L. S. Freeman, Chelsea; E. J. Garner, Petoskey; J. L. R. Hubbard, Waterloo; C. E. Humphrey, Holly; J. A. Jaynes, Muskegon; R. E. Kincaid, Hersey; C. M. McGee, Farmington; J. J. Mason, Lansing; M. G. Millman, South Lyons; B. L. Murray, Ypsilanti; I. J. Rickert, Charlotte; D. M. Russell, Sturgis; F. J. Temple, Ridgway; J. A. Warner, Woodland; Assistants, A. W. Brownlee, J. B. Chapman, H. M. Lamb, W. H. McAllister, H. J. Von Loon, George Van Nostitz, Detroit; A. Bennet, Pattonville; H. Bradley, Williamston; C. Dupree, Holland; C. E. Doyle, Middleville; E. J. Fletcher, Grand Rapids, J. C. Furness, Nashville; E. Hume, Owosso; E. R. Hunt, Lowell: H. J. Isbell, White Pigeon; E. M. Jefferson, Battle Creek; J. Livesey, Adrian; C. N. Reynold, Bangor; F. A. Moon, Lyman; H. Taft, Lowell; S. D. Roche, Concord; W. S. Selvage, Saginaw; W. L. Smith, Fenton; H. I. Rice, Lennox; F. Chadwick, Muskegon.

The twenty-third annual meeting of the Homœopathic Society of Michigan was held at the Morton House, Grand Rapids, May 19th and 20th. On the first day, Dr. C. F. Sterling, chairman of the section on larnygology, read a paper on "Nitric Acid in the Treatment of Diseases of the Nasal Passages," and Dr. T. L. Wilson read a highly interesting paper on "Ophthalmic Therapeutics," which was received with marked attention. On the second day papers were presented by Dr. W. M. Bailey, on "Surgical Treatment of Peritonitis"; Dr. C. S. Mopley, on "Surgery of the Knee Joint"; Dr. S. H. Knight, on "Surgical Dressing"; Dr. R. H Stevens, on "Cervical Degeneration"; and a number of others. Numerous papers were also read by title. Dr. Polglaise, the well-known Detroit physician, is corresponding secretary of the society.

At the recent meeting of the State Eclectic Medical Society, the following officers were elected for the ensuing year: president, Philo B. Wright, Grand Rapids; first vice-president, J. D. Crum, Owosso; second vice-president, C. O. Jennison, Greenville; third vice-president, C. M. Stock, Plainwell; secretary, H. P. Evarts, Oakdale Park; treasurer, J. D. Peters, Grand Rapids; censors, W. H. Smith, Niles; Wm. Bell, Smyrna; G. W. Mafi, Fremont; C. E Cavie, Port Huron. The proceedings of the society were marked by the adoption of an asinine resolution recommending the abolition of the State Board of Trade, its functions to be preformed by an "Examining Board" consisting principally of eclectics and homœopaths.

At the annual meeting of the faculty for the Buffalo College of Pharmacy, the following officers were elected: dean and treasurer, Willis G. Gregory; registrar, Eli H. Long; secretary, John P. Gray; representative in Council of the University of Buffalo, Willis G. Gregory.

The Council of the University of Buffalo have decided to sell the present property of the University and buy elsewhere.

The number of students registered in the Buffalo College of Pharmacy for the session of 1890–'91 showed an increase of 25 per cent over the registration for the previous session, and of 90 per cent over the first year of the College (1886–'87). The increase has entirely filled the present laboratory facilities of the College. The anticipated increase of attendance for the coming session will make it necessary to provide additional accommodations.